

American Forestry

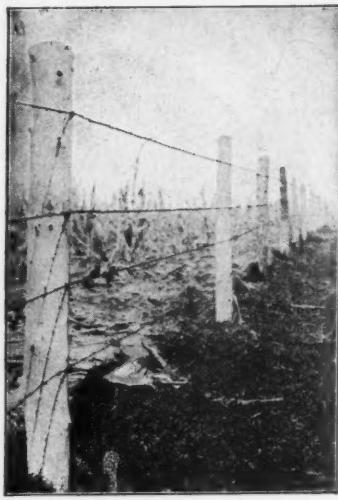
Vol. 22

NOVEMBER 1916

No. 275



THE RED GUM



These Ash posts were *treated* with Creosote in 1905, and when photographed in 1914 showed absolutely no decay. Experts believe they will last 15 to 20 years longer. Photos courtesy Iowa State College of Agriculture.

Species of Wood	Untreated	Creosoted
Ash	6 years	25 years
Cottonwood	3 years	25 years
Red Oak	6 years	20 years
White Cedar	14 years	30 years
Willow	4 years	25 years

Further interesting facts are quoted from Bulletin mentioned above :

First—"By effective creosote treatment it is probable that woods commonly used for posts may be doubled in life (white cedar, oak, etc.)"

Second—"By treatment, many species, at present almost valueless, can be made to last twenty-five years or more, with only a small addition in cost for treatment (willow, soft maple, cottonwood, elm, etc.)"

Third—"Figuring the investment at 6% simple interest, creosote reduced the annual cost of the less durable fence posts by about one-half."

Fourth—"In selecting posts for treatment take the native soft-wooded trees and save the oak, hickory, black walnut, etc., for other purposes."

Fifth—"In creosoting select small posts, those 4½ inches in diameter, if of sufficient strength. They are cheaper, and when creosoted will last as long, or longer, than seven-inch posts."

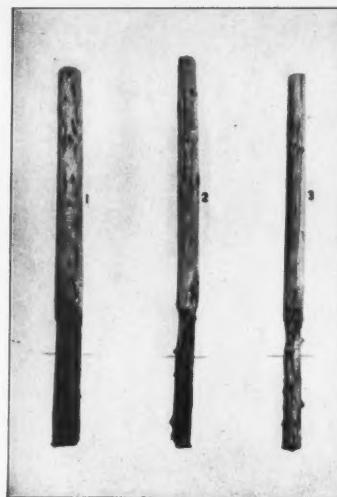
Sixth—"See that the posts are thoroughly peeled of the inner as well as the outer bark."

Proper Creosote Treatment to Increase the Life of Fence Posts

TWENTY-FIVE million fence posts, with a value of about \$4,000,000, are used annually by the farmers of but one of the agricultural states of this country, as reported in Bulletin No. 158 of the Iowa State College of Agriculture.

The value of creosoting these posts is indicated by the following table which shows the comparative life of treated and untreated fence posts of five species of wood commonly used.

Estimated Average Life In Years



Untreated. These Cedar posts were set in 1905 and taken up for examination in October, 1914. In each case the sap-wood was entirely gone; in post No. 1 about one-third of the entire bottom rotted away; in post No. 2 one-half of the bottom decayed.

Creosoted

25 years
25 years
20 years
30 years
25 years

Seventh—"The posts should be thoroughly seasoned before treatment is attempted, or a poor penetration of creosote oil will be secured."

The Best Creosote for all practical purposes is *Barrett's Carbosota Grade-One Liquid Creosote Oil*.

It comes ready for use, in convenient sized packages, and requires no apparatus or skilled labor for its application. Anyone can use it properly at any time.

It has been especially developed to meet the needs of the average consumer.

In addition to fence posts, all lumber exposed to decay, such as sills, joists, etc., should be treated with *Barrett's Carbosota Creosote Oil*.

Barrett's Carbosota is the "Standard" wood preservative for use in the Brush and Open Tank methods of treatment. It is economical, effective and convenient.

Barrett's Carbosota should be carried in stock by every lumber dealer.

It is dependable, easy to sell and profitable to handle.

Illustrated booklet free on request

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AMERICAN FORESTRY

The Magazine of the American Forestry Association

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NOMINATIONS FOR MEMBERSHIP

A special request is made to members of the American Forestry Association to nominate for membership, friends whom they believe will be interested in the work of the Association and who would like to secure the magazine, American Forestry.

I Nominate for Membership:

Signed..... Address.....

AMERICAN FORESTRY is published monthly by the American Forestry Association. Subscription price, three dollars per year; single copies, twenty-five cents.



He Was "Stuck" On His Tract

Once there was a man who had what was reputed to be an exceptionally valuable tract of timberland—no matter where—which he bought on an old-fashioned “timber cruise” plus his personal inspection.

Wishing to take his profit on the investment he confidently offered the tract to James D. Lacey & Company.

Besides the reputation of the tract there were superficial indications of unusual excellence; but Lacey & Company deal only with THE FACTS.

A LACEY REPORT on the tract showed the astonishing fact to be that the value of merchantable timber on the tract was barely more than half what the intending seller sincerely believed he had, although he was an experienced lumberman.

He was “stuck”—badly; in fact a “LACEY REPORT” on the property when he bought it would not have cost a twenty-fifth of what he was “stuck.” This is a true story—with a moral. May we send you “Pointers,” an interesting booklet?



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SEATTLE
1009 White Bldg.

PORTRLAND (ORE.)
1310 Northwestern Bank Bldg.

NEW ORLEANS
1213 Whitney-Central Bldg.

AMERICAN FORESTRY

VOL. XXII

NOVEMBER 1916

No. 275

The Red Gum

Identification and Characteristics

BY SAMUEL B. DETWILER

RED gum is one of our most attractive ornamental trees, but it is equally distinguished for the exceptional beauty of its wood. It has many names. Sweet gum and Liquidambar are names that are applied on account of the fragrant resin which exudes from the bark. Star-leaf gum and red gum are given because of the shape and rich fall coloring of the leaves. Bilsted, alligator tree, satin walnut, Circassian walnut and hazelwood are other names occasionally bestowed upon it. Red gum is not closely related to the black gum and tupelos, but belongs to the Witch Hazel family. There are three related species, one being found in Mexico, one in central China, and the third in the Levant. The latter furnishes the liquid storax of commerce.

The home of the red gum is the region lying south of a line drawn from southern Connecticut through southeastern Missouri and northwestern Arkansas to the Trinity River, Texas. It is most abundant and reaches its greatest size in the lower Mississippi Valley and the lowlands of the southeastern coast. It is a tree that prefers rich moist soil and suffers no harm when the land is flooded for part of the year, but it does not develop well in the permanent swamps where tupelo and cypress thrive. In the bottomlands it is usually found mixed with red maple, elm, ash, cottonwood and oaks. It grows on high land, but on dry soil the trees are of smaller size. The largest red gum trees are 5 feet in diameter and 150 feet high. Average-sized mature trees are 1½ feet to 3 feet across the stump and 80 to 120 feet high. In the forest the trunk is straight and clear of side branches far above the ground. Near the top it forks and forms a spreading crown. Young trees growing in the open have a long and very regular conical top. The bark on old

trunks is grayish brown, tinged with red; it is thick (1 to 1½ inches) and deeply furrowed into broad ridges which are covered with many small scales. Young trees have ashy gray trunks and frequently are covered with a hard, warty growth of bark from which the tree derives the name alligator wood.

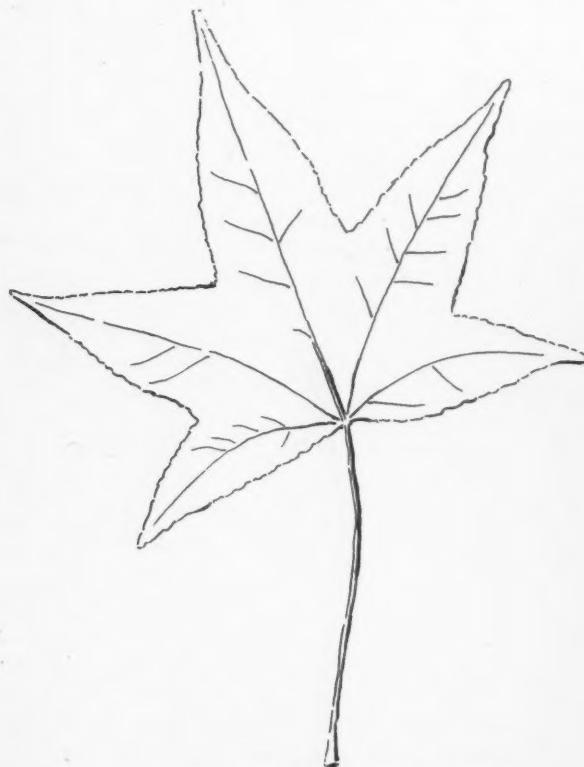
The twigs are rather heavy and somewhat angular, and in the second year, peculiar blade-like ridges of cork appear on them, affording an easy means of recognizing this tree. The smaller branches of bur oak and cork elm have somewhat similar corky wings, but the bark between the corky ridges is not smooth and shining as is the case with the red gum twigs. The lustrous brown buds are about one-fourth inch long and are generally sharp-pointed. The alternately placed leaves are 5 to 7 inches long, and are usually cut into five points shaped like a six-pointed star with one point missing where the stem is attached. Occasionally the leaves have 7 instead of 5 points. They are bright green and glossy on the upper surface and somewhat paler beneath. When the leaves, twigs and buds are crushed, they have the same delightful fragrance as the resin which oozes from wounds in the bark of red gum trees growing in the South.

The flowers appear in March in the South and in April or May in the North, at the time the leaves are half grown. The greenish pollen-producing flowers are borne in dense clusters 2 or 3 inches long at the ends of the twigs. Each flower consists of a number of stamens clustered together and surrounded by small, hairy, leaf-like scales. The seed-producing flowers are greenish balls that hang singly on long threads at the bases of the upper leaves of the twigs. The seed balls are 1 to 1½ inches in diameter and ripen their seed in the fall but remain



AREA OF RED GUM TREE GROWTH
Red gum (*Liquidambar styraciflua*) is distributed from Fairfield County, Connecticut, to southeastern Missouri, through Arkansas and the Indian Territory to the valley of the Trinity River in Texas, and eastward to the Atlantic Coast. Its commercial range is restricted, however, to the moist lands of the lower Ohio and Mississippi basins and of the southeastern coast. While the red gum grows in various situations, it prefers the deep, rich soil of the hardwood bottoms, and there reaches its best development. It requires considerable soil moisture, though it does not grow in the wettest swamps, and does not thrive on dry pine land. Seedlings, however, are often found in large numbers on the edges of the upland and even on the sandy pine land, but they seldom live beyond the pole stage; when they do, they form small, scrubby trees that are of little value. Where the soil is dry the tree has a long taproot. In the swamps, where the roots can obtain water easily, the development of the taproot is poor, and it is only moderate on the glade bottomlands, where there is considerable moisture throughout the year, but no standing water in the summer months.

on the trees until spring, swaying on their long stems like the fruits of the sycamore; unlike the "button balls," however, the surface of the red gum fruit is roughened by numerous coarse spines. These fruits really consist of



LEAF OF THE RED GUM TREE

Red gum is easily recognized by its beautiful, glossy, star-shaped leaves. The star is lopsided because one point is missing where the leaf stem is attached. Usually there are five points to the leaf, but it may have seven. It is plain that "stargleaved gum" is an appropriate name for this tree. If the leaves, buds or twigs are crushed, the agreeable aromatic odor produced explains why red gum is very frequently called "sweet gum." This name also refers to the resin which exudes from wounds in the bark, used for chewing-gum and perfume for glove leather. The name "red gum" may refer to the color of the heartwood, but it probably refers to the brilliant autumnal foliage. Some one has called it "a conflagration of color," to which only the coloring of the maples and the ashes can be compared.

a number of woody pods closely joined together, each pod having two curved, horn-like tips. In the fall the pods split apart, permitting the few good seeds they contain to fall to the ground along with a large number of undeveloped seeds which have the appearance of sawdust.

Red gum begins to produce seed when it is 25 or 30 years old and bears heavy crops at intervals of about 3 years until it is 150 years old, when its powers of seed-ing begin to decrease. Only 50 to 75 per cent of the seeds germinate, and in the native forest the greater number of seeds are destroyed by the long-continued floods to which the land on which much of the gum grows is subjected. The young seedlings require abundant light, and for this reason they are seldom found growing in dense forest under the old trees. The best natural reproduction of red gum is found in old pastures and clearings where the young trees have full sunlight. On cut-over lands stumps of red gum trees under 50 years of age produce a vigorous growth of sprouts. The sprouts grow much faster than the seedlings during

the first few years but seldom form large timber trees.

The red gum has no serious enemies. It grows principally on lands which are often overflowed and for this reason damage from forest fires is comparatively small. In bottoms and on the uplands it produces a taproot, and the strength of its root system prevents much loss from windfall. Insects and fungi attack felled trees and those which have been injured by fire or wind, but occasion no great commercial loss. Cattle refuse to browse on the seedlings because of the pungent flavor of the leaves, but hogs and goats are less discriminating and sometimes



DEEPLY FURROWED BARK OF RED GUM TRUNK

In the best situations red gum reaches a height of 150 feet and a diameter of 5 feet. These dimensions, however, are unusual. The stem is straight and cylindrical, with dark, deeply furrowed bark, and branches often winged with corky ridges. In youth, while growing vigorously under normal conditions, it assumes a long, regular, conical crown, much resembling the form of a conifer. After the tree has attained its height growth, however, the crown becomes rounded, spreading, and rather ovate in shape. When growing in the forest the tree prunes itself readily at an early period, and forms a good length of clear stem, but it branches strongly after making most of its height growth. The mature trunk is usually forked, and the place where the forking commences determines the number of logs in the tree, or its merchantable length, by preventing cutting to a small diameter in the top. On large trees the stem is often not less than 18 inches in diameter where the branching begins. The over-mature tree is usually broken and dry-topped, with a very spreading crown, in consequence of new branches being sent out. Injury to the butts of trees from fire and to the tops from wind or ice often opens the way to attacks from fungi, which cause decay, and from insects, which precede and assist the fungi.



TUPELO GUM SLOUGH, CONGAREE RIVER,
SOUTH CAROLINA

Tupelo gum, found in more or less large quantities throughout the range of the red gum and cypress, is cut to some extent from Virginia to the Gulf and westward to Arkansas. Its best growth, however, is in the Gulf States, and as a commercial timber tree it has reached great importance only in the region about Mobile, Alabama, and in southern and central Louisiana, where it is cut with cypress. In the handling of cypress and the associated tupelo several methods are in use, each adapted to some particular locality. If the land is not too swampy and has a firm foundation, a logging railroad can be maintained and steam skidders used to snake the logs with cables to the road and to load them with bull hooks on the cars. Where the land is so low as to be subject to practically continuous overflow the pull-boat is generally used, and the logs are transported to the mill by towboats.

destroy much young growth. Hogs are especially destructive because they eat the seeds.

Present conditions do not warrant the planting of red gum for the production of lumber on a commercial basis. The supply of standing red gum is large and stumpage prices are low. Instead of planting it will be much more profitable, and, therefore, better forestry practice,

ably. Considerable merchantable lumber is wasted in the woods in high stumps, top logs and trees which are damaged but too small to carry to the saw mill, that would be saved if prices warranted more careful logging. Although it is not reasonable to expect lumbermen to expend money in conservative logging where the financial returns do not justify it, experience with other species,



A LARGE RED GUM, RICHLAND COUNTY,
SOUTH CAROLINA

Red gum is perhaps the commonest timber tree in the hardwood bottoms and drier swamps of the South. It is found also to a considerable extent on the low ridges and slopes of the southern Appalachians, but there it does not reach merchantable value and is of little importance. The hardwood bottoms are for the greater part overflow land. The soil is alluvial and generally of great fertility, and tree growth is for the most part extremely rapid. These hardwood bottoms stretch along nearly all of the Southern rivers on the coastal plain and in the Mississippi Valley States. They are subject to heavy floods in the winter and spring, for the rivers, rising among the mountains, run swiftly until they reach the general plain level, so that any increase in the volume of water is bound to overflow the banks and spread out over the entire width of the bordering swamp, often to a considerable depth. These bottomlands vary considerably in width, but are usually from 6 to 12 miles wide, and are bounded by the sharp banks of the upland plain, the river meandering through the swamp from one bank to the other.

to lumber the red gum forests in such a way that the red gum trees are preserved or occasional seed trees left to re-seed lands where close cutting is practised. Because of the expense of logging, including high freight rates and increased costs of labor and supplies, lumbermen who cut red gum operate on a very limited margin of profit. The result has been wasteful logging and destruction of much young growth. One operator recently stated that under present conditions only 22 per cent of the standing gum timber in Arkansas, Louisiana and Mississippi could be manufactured profit-



SECOND-GROWTH RED GUM, ASH, COTTONWOOD, AND SYCAMORE, ON HARDWOOD BOTTOMLAND, SOUTH CAROLINA

Red gum grows in mixture with ash, cottonwood, and oak throughout the hardwood bottomlands of the South. These rich, alluvial bottoms are among the best natural farming lands of the region. In the past the gum, having no marketable value, has been left standing after logging, or, where the land has been cleared for farming, has been girdled and allowed to rot, and then felled and burned as trash. Not only were the trees a total loss to the farmer, but from their size and the labor required to handle them, they were so serious an obstruction as often to preclude the clearing of valuable land. In the sloughs and perpetual swamps are large quantities of cypress and tupelo gum, and there is some black gum on the ridges. The forest is, for the most part, dense and fairly even-aged. There is little young growth beneath the older trees. Canebrakes are common and are very dense, the cane often reaching a height of 20 feet. This cane, with the briars and rattans, makes a very heavy undergrowth, so that where it occurs no tree reproduction can take place. The result is that the forest gradually becomes rather open in character.

such as white pine, birch or hard maple would indicate that lumbermen will be repaid for giving greater consideration to the second growth of red gum.

The red gum is a superb tree for ornamental planting, ranking with the most beautiful of our Eastern broad-leaf trees. It appears to hold a higher place in Europe as an ornamental tree than it does in America, but this is probably due to its wide natural distribution here. It is hardy as far north as Massachusetts, is easily handled, and grows fairly rapidly. In the South Carolina forests its average growth is 100 feet in height and

15 inches in diameter in 50 years, and height growth is rapid in the early years of its life. The tree is interesting throughout the year. In the summer the large, glossy, star-shaped leaves are unusually attractive. The fall coloring of the foliage is unsurpassed by any other species in the brilliancy of its crimson. Its gorgeous scarlet, red, orange and yellow tints vie with those of the maples. Later the leaves may assume the purple, lilac, brown and bronze tones of the ashes. The red gum gives an excellent winter effect because of its symmetrical form, its sturdy branches with their conspicuous gray, corky ridges and the peculiar spiny fruit balls that hang in abundance from the twigs. This tree should be planted in rich moist soil and should be closely pruned when it is transplanted. It has ability to withstand salt air and

is valuable for seaside planting if soil conditions are good.

The wood is heavy and hard, close-grained and without great strength. The heartwood is a beautiful, bright reddish brown with a satiny luster and frequently with a pleasing, varying figure. The sapwood is nearly white and is usually wide, the smaller sized trees consisting entirely of sapwood. Twenty years ago red gum wood was considered to be of little value because of its tendency to warp, but with improved methods of drying it is now one of our finest furniture and finishing woods. Few woods in America equal it in the beauty of its natural grain and it can be finished to imitate oak, mahogany, cherry, or Circassian walnut. For this reason it has been predicted that red gum will in time equal white oak in value.

Commercial Uses of Red Gum

THE beauty, adaptability and fine working qualities of red gum lumber have promoted it with phenomenal rapidity from a despised species to one of the most respected and prominent cabinet woods. For many years this wood was cut to a limited extent; preference was given to woods easier to handle, because red gum lumber warped and twisted in the process of seasoning. No trouble was experienced with red gum after it was seasoned, and decreasing timber supply finally led to practical experiments in the better utilization of this wood. Technical investigations of the structure of the wood and of the principles of kiln-drying finally overcame the difficulties and a wide market for red gum lumber quickly developed, in spite of the prejudice against it. Occasionally it has masqueraded under assumed names, for it is a common failing of human judgment to believe that ordinary "gum" must be lacking in the superior qualities which the wood possesses when made into furniture of "satin walnut" or interior finish of "hazel wood."

The use of the word "gum" to designate several entirely different species of trees may be responsible for some of the prejudice against red gum. The Eucalypts are frequently called gums, although in no wise related to the true

gums. Black gum, water gum, cotton gum and tupelo are also wholly unrelated botanically to red gum, although they grow in many of the localities where red gum is native. These gums have a twisted grain with the fibers so tightly interlocked that the wood is split with exceeding difficulty. The wood is useful for heavy wheel hubs, rollers, mauls, construction and box material, flooring, and paper pulp. The characteristics of red gum are concisely expressed in Bulletin 58 of the U. S. Forest Service, as follows:

"The wood is about as strong and as stiff as chestnut, or a little weaker than shortleaf pine; it splits easily and is quite brash; it is less tough than cottonwood and splinters less; it is about as hard as yellow poplar and can be worked with tools almost as easily; it has a moderately fine grain, is denser than cottonwood, and has a large proportion of sapwood; the sapwood decays rapidly when exposed to the weather, but the heartwood is quite durable even in the ground. The green wood contains much water and consequently is heavy and difficult to float, but when dry it is as light as basswood, or about 15 per cent heavier than yellow poplar or cottonwood. The great amount of water in the green wood, particularly in the sap,



PEELED RED GUM LOGS SEASONING IN THE WOODS, SOUTH CAROLINA

A large amount of red gum growing in the South can be economically transported from the forests to the mills only by means of the streams, owing to the expense of putting in railroads solely for the timber. Green red gum, however, is so heavy that it scarcely floats. Probably one-third of the logs, those with the largest amount of sapwood, sink. The method of getting the logs ready for the river, now principally followed in the South, is to cut the trees, without girdling, in the fall of the year, or from as early as the first of September until the time when high water sets in, which is usually from the first of January to the first of February. At that season the sap is down and the wood is as light as it ever will be while the tree is standing. When felled, the tree is cut into standard lengths; the logs are then skidded to the bank of the river, and tied in rafts with cypress, ash, or cottonwood, to keep them from sinking, and floated down to the mill as soon as high water comes.

makes it difficult to season by ordinary methods without warping and twisting. This fault can be overcome, however, by special treatment. The color of the heartwood is a rich, reddish brown; that of the sapwood cream white. It is tasteless and odorless, and, when once seasoned swells and shrinks little unless exposed to the weather. Its structure is so uniform that it can be stained, painted, or glued without absorbing much of the material."



QUARTER-SAWED RED GUM VENEER

All red gum, whether figured wood or plain wood, quarter-sawed or plain sawed, has a rich, reddish-brown color, with a character as soft and delicate as the sheen of fine satin, and quarter-sawed figured red gum veneer offers possibilities for matching figure known to no other wood. It produces a great variety of markings and color tones, and selections of flitches may be made to meet the individual taste of the designer. It has equally the beauty of Circassian walnut and mahogany, yet has a distinctive character peculiar to no other wood.

Estimates based on statistics collected by the Bureau of Corporations place the total stand of this wood in the United States at about 50,000,000,000 feet, board measure. In amount it is equal to about one-fourth of all the oaks in the country; two and a half times the hickory; three times the ash; one-fifth more than cypress; nearly three times the maple; many times the elm; and, except the oaks, it exceeds in amount any other hardwood, or group of hardwoods in the United States. In fact, it is estimated that one-eighth of all the hardwood of this country is red gum. It is, therefore, apparent that it is a timber of great importance.

The annual output of red gum lumber has grown enormously. In 1900 only 285,000,000 feet of red gum lumber was cut in the United States or 0.8 per cent of the total annual lumber production. In 1913, there was cut 772,514,000 feet or 2 per cent of the total cut—an increase of 270 per cent in 13 years. To this must be added the red gum used in veneer, slack cooperage, railroad ties and miscellaneous articles, so that it is safe to estimate a cut more than a billion feet each year. In several states red gum ranks second to white oak in the amount of hardwoods used in manufactured articles.

Illinois uses more than 120,000,000 feet annually; Arkansas and Missouri each consumes about 100,000,000 feet, Kentucky and Tennessee more than 50,000,000 feet each. Boxes and crates use a large percentage of the cheaper grades of red gum. Some of the finer grades are manufactured into cigar boxes. In Pennsylvania alone more than a half million feet is consumed annually for this one purpose.

In this country a constantly increasing quantity of red



PLAIN-SAWN RED GUM, FIGURED WOOD

This shows a great variety of stripes and color tones, and is in demand for special cabinet work of all kinds. It is extensively used in the manufacture of high-grade furniture, built-in furniture, stairwork, car construction, etc., both in this country and foreign countries. It is often finished to imitate more costly woods, such as black walnut, cherry, mahogany and especially Circassian walnut, since lumber may be selected which has a natural figure closely resembling that of Circassian walnut. Red gum furniture finished "natural" does not show finger marks and is easily cared for.

gum is used in the manufacture of furniture. The commoner grades are made into drawers, frames, and backing, for desks, bedsteads, tables, etc. Considerable clear heart is used also for surface work, either solid or as veneer. The natural color of the wood is attractive, but it takes stain so well that it is often made to imitate mahogany, oak, walnut, etc. The furniture factories in the cities use annually between 40,000,000 and 60,000,000 board feet of this lumber. A sewing-machine company at Cairo, Illinois, uses 15,000,000 board feet of gum per year in the manufacture of sewing-machine tables. The wood is built up of three $\frac{3}{16}$ -inch pieces, laid crosswise to each other to prevent warping, and usually finished with oak or other hardwood veneer. This method has been found very satisfactory.

One of the most important uses of red gum is for interior finish. Stained or in its natural color, it may be made very attractive, and when properly seasoned fulfills every requirement of a first-class wood for that purpose. Red gum may be obtained in either plain or quarter-sawn lumber, or selected for figure. The figure in red gum is fundamentally different from the characteristic figures of oak and many other woods. Oak's figure in

quarter-sawed stock is due to the medullary rays with certain modifications by rings of annual growth. The figures of plain oak and chestnut, for example, are due almost wholly to the rings of growth. Gum's figure is due to neither. The shades and tones cross the rings in every direction, though they sometimes follow them with some regularity and medullary rays have practically no visible effect. It is hard to explain why some trees are figured and many are not, although it is quite certain that the figure in red gum is influenced by the soil and situation.

The red gum tree produces both sapwood and heartwood. Commercially the term "red gum" applies to the heartwood. Unselected gum or sap gum may be partially heartwood and partially sapwood, or all sapwood.

Practically 60 per cent of the stock coming from the tree is common or sap grade. This finds an almost exclusive use in the manufacture of boxes, for which it has been employed for the last six years, taking the place of cottonwood, pine, poplar, and sycamore, the latter used for tobacco boxes. The export trade of gum timber consists of clear heart, 6 inches wide and over, and of all thicknesses from three-eighths of an inch up to 2 inches. Practically 75 per cent of the clear-heart gum lumber cut in this country until recent years has been exported for use in England, France, and Germany for the manufacture of furniture and inside furnishings, newel posts, stair railings, etc. In England the wood is commonly called satin walnut. In 1912, over 66,000,000 board feet of red gum was exported to Europe.

One-third of the veneer manufactured from domestic woods, or four times the amount demanded of any other species, is made from red gum. It is better adapted than most other woods for cutting into thin sheets; it takes glue better than any other wood; therefore, it has the dis-



DOOR OF QUARTER-SAWED RED GUM,
FIGURED WOOD MATCHED

Two of the most important uses of red gum are for doors and interior finish. Finished in its natural color, or stained, it may be made very attractive, and, when properly seasoned, it fulfills every requirement for these purposes. Red gum veneer-built doors are rigid and free from warp, and rank with the very best, both in appearance and stability. The effects that can be obtained by staining are varied and unusually attractive.



QUARTER-SAWED RED GUM, FIGURED WOOD

Some red gum trees produce what is termed "figured red gum." The colors ramify through the wood, obeying no known law of growth or deposit of earthy matter. It is in this that red gum's figure resembles that of Circassian walnut. The latter, however, has a feature generally absent from gum. It is a modification of the figure, due to the rings of yearly growth. The deposits of the pigments in the two woods appear to be much the same. Note the richness of stripes and color tones peculiar to this method of manufacture. It is used in the best lines of furniture and in artistic architectural woodwork of all kinds.

tinction of being the ideal veneer wood. It is manufactured into rotary-cut, sliced and sawed veneer, and is used for a wide variety of purposes—from light weight fruit packages to the best grades of the richest-colored and highly-figured panels used in furniture, pianos and the most expensive and artistic architectural wood-work of all kinds.

In 1912, over 30 million feet, board measure, of red gum was manufactured into baskets, and fruit and vegetable packages. For the manufacture of slack barrels red gum is now one of the most important woods in the country, ranking second to elm both as a stave and as a heading wood. For paving blocks the essentials are durability, close grain and the power of resisting abrasion. These are found in red gum. For treated blocks, unselected gum is used. The heartwood of the gum is used extensively in the South for fence posts, and, in a limited way, for sills. Where it is carefully selected and well seasoned, red gum is more lasting than red oak or shortleaf pine. Red gum has been used to some extent for railroad ties.

A large amount of red gum is put into wagon-box boards, which have a separate grade under the National Hardwood Lumber Association's rules.

All of the sapwood that will make wagon-box lumber is cut up for this purpose, because, when thoroughly dried and painted, sapwood is as good as heart. Unselected gum siding and ceiling contain no acid or other ingredients injurious to nails. It is close-grained, presenting a smooth surface for paint. It should be primed, however, as a precautionary measure as soon as it is in place. If used for siding, or in any place exposed to the weather, sapwood must be excluded or kept covered with paint. As flooring, red gum wears well, is free from splinters, and does not shrink if thoroughly kiln-dried before it is laid.

Various other articles are made of red gum, such

as coffin boards, barrels, packing boxes, screen doors, mouldings, saw handles, gun stocks, broom handles, mop handles, wheelbarrows, brush backs, mouse traps, all kinds of animal traps, agricultural implements, refrigerators and kitchen cabinets, musical instruments, picture frames, wooden ware, trunks, whips, canes and umbrella handles, tobacco pipes, clocks and toys. The spicy gum which exudes from the bark of the sweet gum and accounts for its name is of commercial value for use in chewing gum, and as a perfume for leather. It is also used medicinally under the name copalm balm, and has been used in incense.

The wood is steadily growing in favor, and at present dealers report orders for all manufactured material they can produce, in fact lack of cars has restricted deliveries until many mills are filled with orders awaiting shipment.

A "TEAR-DOWN" CAMPAIGN

TO test public sentiment regarding obnoxious advertising posted on public highways, the Massachusetts Forestry Association recently declared a "Tear-Down Week," beginning October 9th. The members of the Association were asked to help individually. Automobile clubs, women's clubs, Boy Scouts, and the tree wardens were requested to assist. The newspapers all over the State fell in with the idea and commented favorably on the plan in their editorial columns, and tree wardens, whose duty it is to protect the trees from these signs, were vigorously reminded of their neglect of duty.

Massachusetts has two laws regarding this subject, one which declares all signs, not required by law, that are posted within the limits of the public highway, "a public nuisance, and may be forthwith removed or obliterated and abated by any person." The other refers to signs on trees within the public way.

Under these laws anyone in Massachusetts may remove any advertising sign within the public highway, except those that are required by law, and the Forestry Association's aim is to inform the people concerning these laws and to encourage the removal of all such signs. Reports are coming in from tree wardens and other individuals and groups stating that these signs, running into the hundreds in their respective communities, have been removed.

To those who knew the conditions before this campaign was started, the results are very gratifying. Thousands of miles of highways in the state are now free from signs and the Association proposes to carry this work further and offenders who persist in this illegal method of advertising will be prosecuted.



RED GUM FOR INTERIOR TRIM

Some red gum trees produce what is termed "figured red gum." The figure in red gum is fundamentally different from the characteristic figures of oak and many other woods. Oak's figure in quarter-sawed stock is due to the medullary rays with certain modifications by rings of annual growth. The figures of plain oak and chestnut, for example, are due almost wholly to the rings of growth. Gum's figure is due to neither. The shades and tones cross the rings in every direction, though they sometimes follow them with some regularity, and medullary rays, have practically no visible effect. The colors ramify through the wood, obeying no known law of growth or deposit of earthy matter.

FIRE DANGER SHIFTS TO EAST

ALTHOUGH final figures are not yet available, reports received by the Forest Service indicate that the forest fire season in the West and North is practically at an end. At the same time, say the officials, the fall fire season is just beginning on the National Forests in the Southern Appalachians.

The difference in the occurrence of the fire seasons is caused by the difference in the character of the forests and of the climate in the two regions. In the North and West the forests are composed almost entirely of conifers, and are located at comparatively high altitudes or high latitudes. The greatest fire danger in these regions occurs during the late spring and summer months, when the rainfall is light. During the rest of the year, there is, as a rule, enough rain and snow to prevent fires from starting. On some of the forests in southern California, however, the fall rains are sometimes late in coming and the fire-fighting organization must often remain on duty until late in November.

In the Southern Appalachians, however, the situation is practically reversed. The forest is largely composed of hardwoods and the heaviest rainfall occurs in the spring and summer and about two months in late winter. As a result, there are two distinct fire seasons. The first of these occurs in the fall, when there is usually little rain and the ground is covered with the dry fallen leaves, which are very inflammable. The fall fire season lasts until about December 15th, when the winter rains set in. In the later winter months, the woods dry out and in February or March the spring season begins, and continues until the spring rains come or the trees and plants put out new leaves and become too green to burn readily.

Trees In Medicine

By JOHN FOOTE, M.D.

Associate Professor of *Materia Medica and Therapeutics*, Georgetown University School of Medicine, Washington,
D. C., Author of "*Essentials of Materia Medica and Therapeutics*"

THE idea that agencies of specific value in the alleviation and cure of disease are to be found in plants and herbs is one of the most deep-rooted, as well as one of the most ancient, of human beliefs. The remote folk-tales of archaic peoples embody this idea and relate its application by the hero, the magician or the priest. Even to-day we have our "herb doctors," and we do not need to go back much farther than a generation to recall the drug store, where large stores of "roots and herbs" were kept. There the apprentice was required to have sturdy shoulder-girdle muscles that he might turn the huge mill in which vegetable drugs were ground, or wield the pestle in the heavy iron mortar, where they were crushed, preparatory to being turned into decoctions, infusions, tinctures and other bulky preparations.

Nowadays we have more elegant, if less vigorous and copiously substantial, medicines prepared in the wholesale pharmaceutical laboratories. Gone is the drug mill, and it requires little muscle to serve soda water and perfumery. Gone, too, are many of the medicines from "roots and herbs" beloved of our fathers, but now shown to be valueless in the light of experimental pharmacology and our newer knowledge of pathology and bacteriology. For we have learned that medicines, except in a few instances, do not remove the cause of the disease, but may simply improve our natural resistance by aiding symptoms.

We have heard of "roots and herbs" in medicine, but, neither in ancient or modern pharmacy, nor in household medicine, do the products of trees as medicinal agents elicit much comment.

And yet, in spite of the pharmaceutical image breakers and the therapeutic

nihilists, some of the most valuable remedies used in medicine come from trees. And by trees is meant *trees*, not shrubs or bushes. One of the veritable Titans of the forest, a tree that has equaled the Big Trees of California in height, furnishes a much-used medicinal oil. And the one vegetable drug that is a specific for a certain disease, and cures by killing the blood parasite which causes malaria, was known to the older clinical teachers simply as "the bark," because it was the bark of a tree.

The place of trees and their products in medicine is far from being an incidental or an unimportant one, even in the most conservative works of the most advanced therapeutists.

And if, as has been asserted, the decadence of Rome was really due to malaria, and if her glory was obscured

by a cloud of mosquitoes rather than by the dust of battles, then it may be that the possession of some cinchona and the planting of the eucalyptus in the Roman marshes might have prevented a great civilization from withering and fluttering away and changed the countenance of history.

But now to discuss some of the trees from which drugs and medicines are obtained:

The tallest tree known, the *Eucalyptus amygdalina*, is one of the many species of eucalyptus found in Australia. It has been known to reach a height of 480 feet. Its brother, the *Eucalyptus globulus*, which is the popular medicinal variety better known as the blue gum tree, is itself no dwarf, since it attains a height of 375 feet. It grows very rapidly, in almost any climate with a mean temperature of about 60° F., but does not endure temperature below 27° F., and is cultivated in the south of

OLDEST TREE PRODUCT PRESCRIPTION IN THE WORLD

This papyrus, written, it is estimated, about the time that Moses was twenty-one years old, contains several prescriptions composed in whole or part of tree products. One is for the medicinal employment of the *ricinus* (degm) tree. The stems, it is declared, when infused in water make a lotion which cures headache; the berries chewed with beer relieve constipation; the berries crushed in oil make the hair grow, and pressed into a salve will cure an abscess in ten days, if applied every morning. The god Seb prescribes wine made from dates to cure wounds and skin diseases and Isis supplies a formula containing juniper berries for pains in the head. The papyrus is in the British Museum.



THE TREE FROM WHICH QUININE IS OBTAINED

The cinchona tree in Ceylon, cultivated in rows of trees lining avenues. Note the white longitudinal marks on the trees where the workmen have removed the bark. This is in marked contrast to the destructive methods formerly employed.

Europe, Algeria, India, Egypt, Natal and lower California. In the latter place it was extensively planted along the line of the Central Pacific Railroad. The large dark green leaves contain a pungent volatile oil, with a characteristic odor, which is noticed wherever the trees grow. For a long time these trees were planted in malarious neighborhoods, in the belief that their aroma prevented the prevalence of malaria, but any such result as was obtained was probably due to the improved drainage in marshy localities, brought about through their rapid growth.

Oil of Eucalyptus, distilled from the leaves, is an antiseptic and carminative. It is much used as an ingredient of antiseptic oil sprays in catarrhal diseases of the nose and throat, and is also used in tooth pastes, mouth washes, etc., when a mild aromatic antiseptic is desired.

Before the throat specialist uses the soothing oil application, he may employ a more stimulating one containing the oil of the pumilio pine. This has practically the same field of uses as eucalyptol. Various conifers, the *Pinus pinaster* in France, the Scotch pine (*Pinus sylvestris*), the swamp pine (*Pinus australis*), the loblolly (*Pinus taeda*), the long-leaved pine, southern yellow pine, Georgia pine (*Pinus palustris*), are sources of oil of turpentine and resin.

Oil of turpentine has some vogue as a counter-irritant in various liniments, and externally and locally in abdominal distention in typhoid fever and after abdominal operations. Resin enters into the composition of resin cerate and is the basis for some plasters. A derivative of turpentine is terpin hydrate, a drug of great popularity and considerable value in coughs and colds.

The beech (*Fagus sylvatica*, *Fagus Americana*, etc.), which is found in the temperate zone in Europe, America and Asia, is valuable in medicine for the creosote distilled from its tar. Creosote, creosote carbonate and guaiacol are medicines used to supplement the hygienic measures which have done so much to reduce the death rate in sufferers from pulmonary tuberculosis.

One of the most ancient medicines is nut-gall, a spherical body which is produced on certain species of oak by the irritation of insects in laying their eggs in the leaves of the trees. Pliny, Theophrastus and Dioscorides wrote of the medicinal uses of nut-galls. Hippocrates, as well as Pliny, recommended them for ulcerated gums, sore mouth and other conditions. The Somali women of Africa make a tattoo pigment from nut-galls. They have long been used to make ink, and are the principal source of medicinal tannic acid. When nut-galls or tannic acid are employed to-day they are used for the same astringent



GUM ARABIC FROM THE ACACIA TREE

Natives of Senegal, Africa, where the tree flourishes, slit the bark in order to obtain the gum acacia or gum arabic. This is a constituent of important preparations in pharmacy, such as making of emulsions and in the preparation of pills and troches.

purposes for which they were recommended by the ancients. The galls are spherical bodies, $\frac{2}{5}$ to $\frac{4}{5}$ inch in diameter, and contain 27 per cent to 77 per cent querco-tannic acid. The *Quercus infectoria*, of the Orient, furnishes most of the nut-galls, though the wood of all species of oak is also rich in tannic acid.

Whenever a pessimistic physician says that drugs never cure disease, some one is sure to ask him about quinine. For quinine is one of the few antiseptics which, taken internally, will kill an invading parasite without also killing the patient. Malaria is caused by a minute parasite injected into the blood through the bite of a mosquito. The parasite usually raises a new family every other day; hence the intermittent chills and fever. Quinine, taken in proper doses and at proper intervals, will kill this parasite and cure the disease by destroying its cause. It is, therefore, a specific drug. There are few specifics.

In 1632 the Governor of Peru was much worried about his wife, the Countess of Chinchon, who was desperately ill with chills and fever. The Corregidor of Loxa recommended the bark of a certain tree which the Indians used as a medicine. The medicine was given and the Countess recovered. The bark was then rewarded for its

good behavior by being called Cinchona bark. The Jesuit order afterward introduced it into Europe, where it was called Jesuits' bark.

The *Cinchona calisaya*, *Cinchona succirubra* and other species of Cinchona are trees of various sizes, some reaching a height of 80 feet or upwards. Of the forty species, about a dozen are of economic use. They are native to New Granada, Ecuador, Peru and Bolivia and grow in dense tropical forests, in isolation or in small clumps. The work of securing the bark is of great hardship to the Indian *cascadores*. Having found a tree, the *cascadore* must literally hack his way to it, clean it of surrounding vines, and brush and strip the bark from its trunk, later felling the tree and stripping the branches. The



A GROUP OF MANNA TREES IN SICILY

Manna the exudation obtained by incising the *Fraxinus Ornus*, is a remedy more esteemed by our grandfathers than by the present generation.

work of drying, packing and transporting this bark is done under equally adverse conditions, and the entire enterprise is difficult, dangerous and wasteful.

As early as 1854 the Dutch Government endeavored to cultivate cinchona in Java. A successful industry was established in the East Indies in 1861. Now it is cultivated in Ceylon, southern India, British Burma and many similar tropical climes, and is an industry of great commercial value. Of the several alkaloids found in cinchona bark, quinine is the most important, medically and commercially.

Ask any physician, "What is the most useful and most used stimulant to the heart and nervous system?" and he will answer: "Strychnia."

Strychnia is an alkaloid found originally in the seed of the *Strychnos nux-vomica*, the poison-nut tree, found in India, Burma and Siam, and growing also in Cochin China and Australia. It is of moderate size, and has a fruit the size of a small orange with a hard shell and a bitter pulp enclosing one to five seeds, less than one inch in diameter.

and one-fourth inch thick and shaped like disks. It is the bitterest substance known, and when one has heart failure, or nervous exhaustion, or is run down or needs a tonic, some doctor is sure to give him the alkaloid from one of these peculiar Indian trees. Textbooks on medicine frequently refer to "emergency heart stimulants," meaning by this drugs used by hypodermic injection to produce prompt stimulation of a weakened heart. Some of the most valuable heart stimulants require a good deal of time after being given to produce their effects, hence the need of emergency heart stimulants. Strychnine, we know, is a splendid emergency heart stimulant. But another one, hardly less valuable, is caffeine. Caffeine is a principle discovered in the coffee bean, which grows on a bush, not a tree—the *Caffea arabica*. Tea leaves contain a substance, identical with caffeine, called theine. The most important commercial sources of caffeine are tea leaves and the kola nut. The kola nut is the seed of the *Sterculia acuminata*, a tree found in Guinea, especially near the coast, and now cultivated in South America and the West Indies. It is a very important commercial product to



TAKING MEDICINAL TREE PRODUCTS TO MARKET IN CEYLON

These unwieldy carts, drawn by patient bullocks, are the chief means of transporting to market in Ceylon the several tree products obtained there which are used in the manufacture of medicines. These carts are loaded with cinchona bark and cinnamon.

the portion of Africa where it is found, because it is rich in caffeine and contains besides a somewhat similar substance called theobromine. For generations the natives have been accustomed, both in health and disease, to chew the kola nut as a stimulant.

Caffeine is a powerful drug, for it stimulates not only the heart, but also the depth of the respiration, the working power of the muscles, the excretory function of the

kidneys, and is the one drug which will stimulate the thinking mechanism of the brain and increase the imagination. To the native of Guinea the kola nut corresponds to our morning tipple of coffee.

Another African tree which has various species—several hundred in fact—throughout the world, and is of some medical interest, is the Acacia. The *Acacia senegal* is the type of tree which furnishes gum acacia, or gum arabic. While acacia is not possessed of any marked curative properties of itself, it is a constituent of many important preparations in pharmacy, as, for instance, in the making of emulsions, where its heavy mucilaginous qualities make it a valuable vehicle for oily and resinous substances. It is also widely used in the preparation of pills and troches.



CINNAMON USED MEDICINALLY

Natives of Ceylon preparing cinnamon by loosening the bark from twigs and branches. This is used as a medicinal agent, but more as a flavor.

Gum catechu, a substance containing tannic acid and used in dyeing, which was at one time extensively used as a remedy in colitis and dysentery, comes from the *Acacia catechu* and *Acacia sumnis*, both native to India.

We know that the Willow is useful for its timber, for basket-weaving, paper pulp, etc. The crack willow (*Salix fragilis*), the white willow (*Salix alta*), the weeping willow (*Salix Babylonica*), and many other species, are known. All are useful to produce medicinal charcoal and all contained salicin, a glucoside, and the forerunner of salicylate of soda, salol, aspirin, etc.—almost specifics for acute rheumatism and grippe, and among the most useful of modern therapeutic inventions. Although salicylic acid is made commercially from carbolic acid and soda, and the occurrence of salicin in the willow is, therefore, of more theoretical than practical interest nowadays, there exists a tree the oil from which contains an almost chemically pure salicylic compound, methyl salicylate. This has practically undeveloped possibilities as a source of chemically pure salicylic acid, when a product is wanted superior to that made synthetically. The bark of the black birch, *Betula lenta*, yields this oil in distillation. The birches grow extensively in Europe, Asia and America; they have practical uses and may be cultivated in almost any northern climate. The relative cheapness of the synthetic acid has probably prevented the more extensive use of birch and wintergreen oils as sources of the salicylates. The old woodsman's medical lore, which came to him from the savage, taught him to use these oils to cure "rheumatics." Here again, as in the case of cinchona, of nux-vomica, of kola and of coca, the scientist has builded his highway to medical knowledge on the trail blazed by the savage.

The citrus group, orange, lemon, etc., furnish us with citric acid, useful as a solvent and as a flavoring agent, while the almond furnishes a bland oil, and its cousin, the wild cherry (*Prunus serotina*), has a waning popularity as the base of a cough syrup. The antiquity of the almond is shown by allusions to it in the Old Testament. Aaron's rod was plucked from an almond tree.

Another ancient sacred tree is the Sandalwood (*Santalum album*). References are made in the Chaldean inscriptions to this tree, and it is used in the sacred rites of the Buddhists. The oil has a limited use in medicine in certain catarrhal inflammations, and is employed in perfumery and sachets. It is found in India and the Pacific islands.

The Pomegranate is a rather small tree, but has many claims to medical antiquity. The *Punica granatum* is found in India, Afghanistan and the regions south of the Caspian. It is mentioned in the Odyssey and in the Old Testament. The bark is used as a remedy for tape-worm and is very effectual.

The *Myroxylon pereiræ* is a lofty leguminous tree, growing in a limited area in San Salvador and Central America, and cultivated in Ceylon. Balsam of Peru, a



SIXTEENTH CENTURY USE OF GUAIAC

A print of the sixteenth century showing the pharmacy and medicinal uses of *Lignum vitae*, or guaiac. On the right a man is chopping up the logs of wood, the woman is weighing out quantities of the drug, and a decoction is being boiled in a kettle. In the room to the left the physician is offering the beverage to the patient, who seems none too well pleased with the prospective draught.

viscid, aromatic balsam, used in surgical dressings and in perfume, is obtained from this tree. From its cousin, the *Myroxylon toluiferum*, comes balsam of tolu, once used in cough syrups. Another balsam, storax, employed as an insecticide, comes from an oriental tree, the *Liquidambar Orientalis*, while the sweet gum of the United States (*Liquidambar styraciflua*), furnishes a resinous sap employed medicinally for catarrhal troubles.

A majestic tree that flourishes in the East Indies, the *Dryobalanops aromatica*, is the source of borneol or Borneo camphor. Japan, or ordinary camphor, is obtained from the *Cinnamomum camphora*, a tree flourishing in Japan, Central China and Formosa. The crude camphor is obtained by distillation of chips of wood, and is later refined by sublimation.

Camphor is a well-known household remedy for external application. Internally it is of value in ordinary colds, coryza, and as a diffusible heart and circulatory stimulant.

Quassia, the bark of the *Quassia amara*, a South American shrub, named after its discoverer, the negro Quassin, who used it in fevers, is now largely replaced by so-called quassia wood, which is really the wood of the *Picraea excelsa*, or bitter ash, a tree found in Jamaica. It attains a height of 50 feet. It has little value in fever, but

is a bitter tonic, and its infusion is used to kill intestinal parasites.

Cinnamon, used more as a flavor than as a medicinal agent, is the bark of a tree, the *Cinnamomum Zeylanicum*, found in Ceylon. Benzoin, a gum-resin, used in medicine as an inhalant, and containing vanillin and benzoic acid, is obtained by incising the bark of the *Syrrax benzoin*, a tree of considerable size, native to Sumatra and Java.

Resin of guaiac, used in gout, rheumatism and sore throat, is obtained from the heartwood of the *Guaiacum officinale*, or *Lignum vitae*, a native of the West Indies and the north coasts of South America, which grows to a height of 20 or 30 feet. One of the most useful and delicate tests for the identification of blood is performed with the aid of an alcoholic solution of guaiac.

Myrrh, with gold and frankincense, was brought as



EIGHTEENTH CENTURY PRINT EXPLOITING QUASSIA

The bark of the *Quassia amara*, a South American shrub which is now used as a bitter tonic and an infusion of which is used to kill intestinal parasites, was believed in England in the eighteenth century to have almost every medicinal property. The print indicates that it cured apoplexy, palsy, constipation, debility, colic, stupor, dropsy, scurvy, dysentery, and other ailments.



CRUSHING MEDICINAL TREE PRODUCTS

In this etching of a drug store, in the year 1536, described by Otto Brunfels of Mayence, Germany, in his book "The Reformation of Pharmacy," the drug clerk is seen crushing in a large iron mortar some tree product used medicinally.

servation of medicine-bearing trees, for there are many species whose existence is threatened by the present hazardous and wasteful methods of obtaining their products.

a gift to the Messiah by the Magi. It was valued by the ancients as a perfume, and was used by the Egyptians in embalming. Myrrh is a gum-resin, a product of the *Balsamodendron Myrrh*, a small tree which grows in Eastern Africa and Arabia. It is little used in medicine nowadays, except as an application in certain conditions of the gums. A curious survival is

the ancient custom, dating back at least to the time of Edward I, of presenting to the King of England on the feast of the Epiphany, gold, frankincense and myrrh, the ceremony taking place in the Chapel Royal.

These are some of the medicinal uses of substances obtained from trees. Much remains to be done in the cultivation and con-

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Conservation of American Wild Flowers

By R. W. SHUFELDT, M.D.

With this issue AMERICAN FORESTRY starts a series of articles on flowers by Dr. R. W. Shufeldt of Washington, D. C., a scientist who is internationally known and esteemed for his able writing on many scientific subjects. Dr. Shufeldt will give his special attention to these articles and in connection with them will answer any question and give advice regarding flowers to any members of the American Forestry Association.—THE EDITOR.

WHILE very considerable attention has been paid to the protection and conservation of the forests of the United States, there has not, up to the present time, been a corresponding solicitation engendered with respect to our indigenous flora, or to the long list of beautiful, flowering plants of the country. A great deal has been published—indeed, sufficient to form a young library—on the question of the extermination of a large number of species of our birds, and certain mammals have been extensively treated in a similar way; many kinds of insects, too, have received their share of notice at the hands of writers upon such subjects. For some reason or other, however, as just stated, the question of the extermination of certain of our wild flowers has been singularly neglected, and the public mind has but rarely been awakened to the fact that not a few of our most interesting and beautiful wild flowers stand in imminent danger of becoming extinct over considerable areas of territory, or even, in some instances, utterly exterminated.

Recently a number of interested and capable writers have invited attention to this matter, and it will attract still further notice in the near future. What I have said in the last paragraph will apply, perhaps, to towns and cities all over the world; and when I say perhaps, I have in

mind the cities of Japan. As the Japanese are great lovers of wild flowers, these artistic and cultured people may not habitually exterminate them in the environs of their great cities; in any event, we may believe this until we know to the contrary. However this may be, there is no question but that it is going on in this country all the time; and the writers to whom I refer above have very conclusively shown that, where wild flowers were very abundant only a comparatively short time ago—in the outlying neighborhood of such a place as the New York Zoölogical Park in the Bronx, for example—they are now practically exterminated. This has been brought about by their not having been properly and systematically cared for and conserved. Within the jurisdiction of the Zoölogical Park the case is very different, for very stringent laws have been rigidly enforced, and, as a consequence, not a single blade of grass is bent down by human feet, nor are other plants injured if the authorities can prevent it. This is not the case, however,—be it said to our lack of care and foresight—with respect to the National Zoölogical Park and Gardens, where people roam at large, and hold populous picnics and other gatherings; flowers and shrubs, plants and trees suffer accordingly.

There are two principal ways of preventing this



GRASSHOPPERS EATING GOLDEN-ROD

FIG. 1.—Two species of grasshoppers, feeding upon the leaves of the Common Golden-Rod at the end of summer. The ragged edges of the leaves indicate where that part of the plant has been devoured; in some instances nothing is left save the mid-rib of the leaf. This specimen was collected in the northwest section of Washington, D. C., and photographed by the writer from life, natural size. The open city lot, in which the plant grew, swarmed with these grasshoppers; it is very evident that these fellows are no conservators of wild flowers.



THE PINK AZALEA DISAPPEARING

FIG. 2.—This beautiful specimen of the Pink Azalea (*Azalea nudiflora*) was collected in southern Maryland early in the spring. This Azalea is classed among the shrubs, and grows from three to six feet high, though generally it is a branching, leafy bush. The clustered flowers come out about the same time as the leaves, or a little earlier, and they are of a rose or pinkish red color—sometimes very pale or almost white, with very little fragrance. It occurs coast-wise from northern New England well down into the Southern States, and blooms throughout the spring months in the District of Columbia. There are five small teeth to the calyx; note the funnel-formed corolla, with its five recurved lobes. There are five exerted stamens, with but one elongate pistil bearing a single, black stigma. The leaves are dark green with unbroken outlines and elliptical in contour. This elegant shrub is being rapidly exterminated in the environs of our eastern cities, where it formerly grew in abundance. It is frequently gathered in great bunches, only to wither and be thrown aside in the woods. Pink Azalea belongs in the Heath family.

species of vandalism: legal protection on the one hand, and the inaugurating of such steps in the community as will make for an enhancement of the tastes of the people on the other, to the end that a love for the beautiful in general, and for wild plant-life in particular, may be engendered.

Our wild flowers see another powerful and merciless enemy in the automobile, or rather in the thousands of people they daily convey from any one of our great cities into all parts of the country, far and wide, surrounding such metropolitical centres. How often we see one of these cars, homeward bound, its occupants holding large bunches of dogwood in full flower, and great bunches of many species of other flowers and plants that have attracted the eye, but not called into play that conservative sense which makes for the preservation and not the

destruction of all that is beautiful, and often useful, in nature. With other true nature-students, I love to see people bring bunches of flowers into the home, especially if they be brought there for the purpose of careful botanical study along different lines of inquiry, or even for the purpose of at once placing them in a generous receptacle



BOTH FLOWER AND FOOD

FIG. 3.—Of recent years Chicory or Succory (*Chicorium intybus*) has occurred abundantly in some of the Middle Atlantic States, and in the District of Columbia; it is found growing in vacant lots in the very heart of Washington, and almost everywhere in the suburban parts of the city. Its brilliant blue—or sometimes white and even pinkish—flowers are familiar to many, enlivening the rank verdure flourishing where the plant thrives. The flowers wilt almost as soon as picked, and consequently many are needlessly destroyed. In the specimen here shown the flowers were a bright sky blue, with the buds in various stages of growth. They appear nearly sessile along the straight, fluted, branching and hairy stems, and are entirely odorless. The elongate, oblong petals are distally toothed or finely serrated, and the lanceolate leaves (not shown here) are entire. Confined chiefly to eastern districts, it came, nevertheless, apparently from far-off Arabia. Its long, somewhat stoutish roots furnish the chicory with which coffee is adulterated. In France a salad is made of its leaves, and the roots are eaten in Egypt. In Washington it blooms from mid-summer until late in the autumn. The specimen here shown is a good representative of the Chicory family, to which it belongs. It is reproduced natural size from a photograph by the author.

containing water, in that they may lend to the home that peculiar beauty and attractiveness that flowers alone can do. Clearly this is a very different matter compared with reverse instances, or where we see an outing party in an incoming car bringing quantities of wild flowers, flowering branches of shrubs, and the like. Only too often the smaller plants have been pulled up by the roots—a most vicious practice, and one leading to the certain extermination of the species so dealt with, as I have elsewhere pointed out. The collection of flowers and plants thus gathered is only too frequently tossed out of the car to wither on the roadside, before coming into the city; I can vouch for this from abundant personal observation, extending over a long time. Occasionally, such bouquets of flowers are carried as far as the entrance to the garage, where they are thrown into the alley or street, to be swept up with other refuse by those employed for such purpose.

In future articles, I shall have pleasure in pointing out in these pages the best methods to be pursued in studying the wild flowers near the home, and how such researches may be made to benefit, not only the student undertaking them, but the people in general. This will include the forming of an herbarium; the correct way to collect flowers; plant and flower-photography, and similar pursuits that it does not fall within the scope of the present article to touch upon.

Among the prin-

HELP TO SAVE WILD FLOWERS

THE beautiful wild flowers of this country are steadily decreasing, and some will soon disappear entirely, unless people give more attention to conserving them.

Pluck wild flowers without limit, if you wish, but do not pull them up by the roots, nor strip full branches from flowering shrubs and trees. This will prevent their destruction.

Public education is necessary. Repeat the paragraph above to children and adults and ask them to pass it along. It will help.



VIOLETS ARE RAPIDLY DECREASING

FIG. 4.—Here we have the Bird's-foot Violet (*Viola pedata*), a most lovely representative of the Violet family; it occurs from Maine to Minnesota and southward. This charming member of a truly historical assemblage of very familiar and much admired flowers the world over is now being rapidly exterminated in the environs of many of our eastern cities and towns, where formerly it flourished in great abundance. During the month of May, which is the time of its blooming, ramblers through the woods often gather the flowers in bunches of from fifty to a hundred or more. Frequently the plant, growing in loose soil, is pulled up by the root, which results in its more certain destruction and ultimate elimination in many districts. The photograph was made of a plant growing in the woods of northern Virginia, and well shows how the flower forces its way through the dead oak leaves in the spring. The form of the leaves is well shown; the flowers show the appearance of two perfect ones, while the three others are in the various stages of final curling up. This specimen is probably *Viola pedata bicolor*, a most elegant variety of the common form. The upper petals are of a rich purple, and as soft as velvet, the three lower ones being very pale and arranged as shown in the illustration. We have a number of species of violets among our wild flower flora, and mention is made of them in many classes and kinds of literature.

pal plants and shrubs standing in need of protection, with respect to thoughtless and injudicious gathering, I may mention, first of all, our Trailing Arbutus (*Epigaea repens*), so well known to those who know anything at all of our more familiar species that a description here is rendered quite unnecessary. As a flower, it is one of the favorites in American history. In New England it is known as the Mayflower, as it is one of the earliest flowering species of spring. Whittier loved its blossoms, and in one of his beautiful poems he said of it:

"O sacred flower of
faith and hope,
As sweetly now and
then
Ye bloom on many a
birchen slope,
In many a pine-dark
glen."

And Neltje Blanchan, in her charming "Nature's Garden," asks us: "Can words describe the fragrance of the very breath of spring—that delicious commingling of the perfume of arbutus, the odor of pines, and the snow-soaked soil just warming into life? Those who know the flower only as it is sold in the city streets, tied with wet, dirty string into tight bunches, withered and forlorn, can have little idea of the joy of finding the pink, pearly blossoms freshly opened among the withered leaves of oak and chestnut, moss, and pine needles in which they nestle close to the cold earth in the leafless, windy northern forest."

I can remember when, fifteen or twenty years ago, great patches of arbutus could be found in many locali-

ties about Washington, well within the city limits; but now one frequently has to hunt long and well to find it in sufficient quantity to make a small bouquet. The plant is becoming more and more rare every year, not only because the city has three or four times its former population and a great many more people ramble through the woods than formerly, but the increasing rarity of the flower is to be accounted for by the gatherers culling it in excess of their needs. Then, too, as I said before, less pains are taken in plucking the flowers—the delicate little trailer is only too often pulled up, roots and all. Posted preserves and other deterrents militate against this to some extent; but I have faith in the true American; were he or she to know of the damage they do, a simple appeal would have the effect of saving many a growing plant of trailing arbutus.

What I have said here about this flower applies to not a few other species, such as red cardinal, blue cardinal, various species of violets, especially the bird's-foot violet, here shown in Figure 4, the bluets (Fig. 5), bloodroot, anemones, and others. With such flowers as black-eyed susans, golden-rod, and so on, little harm is done in this way, for these plants grow in such wonderful abundance and profusion—sometimes covering acres—that they defy reduction through excessive culling.

Shrubs suffer in a somewhat different way, for here the branches of varying sizes are deliberately broken off—generally the ones nearest the ground and bearing the greatest profusion of

QUESTIONS ABOUT FLOWERS AND SHRUBS

AMERICAN FORESTRY invites inquiry about flowers or shrubs. These inquiries will be promptly answered. There will be no charge. Questions about the structure and physiology of plants; their distribution and conservation; their economic uses, if proven; their friends and enemies, including birds, insects, and other living forms,—indeed anything that refers to their natural history will be answered.

American Forestry also aims to exploit anything that lends itself to inducing our boys and girls to study and collect American wild flowers; to photograph them, and form botanical clubs where collections of pressed flowers may be kept for the use of members.

Address all inquiries to

AMERICAN FORESTRY,
Washington, D. C.

flowers. In a few seasons—sometimes even in one season—this results in entirely destroying the shape of the tree or shrub, in seriously diminishing the amount of its normal florescence, and in damaging the growth generally. Usually the pink azalias (Fig. 2), the dogwoods, and others that can be reached for the purpose, are the victims of the vandalism to which reference is made. I feel that the present article will not have been written in vain should it have the effect of checking, to any degree whatever, the steady destruction that takes place every spring—sometimes all summer long—of the wild flowers in the woods and fields surrounding our populous cities.

Although not altogether within the scope of the present article, I am sure it will not be taken amiss when I invite attention to the fact that, in many places—more particularly in certain cities in California—a taste has arisen, and in some instances very extensively cultivated, for the care of many species of our wild flowers in gardens, or under conditions demanding even more land than a garden amounts to—something after the out-of-doors nursery order. Here they are studied, photographed, cross-fertilized, and admired, often with greater pleasure and profit than in their normal places of occurrence in nature. This very satisfactory and encouraging taste is also to be noticed in certain places in the eastern districts, and it should by all means be furthered by any one who aims to assist in preventing the extermination of many of our



FEWER QUAKER LADIES EVERY YEAR

FIG. 5.—The quaint little four-cleft Bluet or Quaker-Ladies represent another flower that is often ruthlessly gathered, only to be thrown away with others picked at the same time. It may be well to know that if a bunch be plucked by themselves, they will last a long time in a little vase filled with water. It occurs more or less abundantly, from all the northern parts of the United States to Michigan and southward. Few wild flowers are better known than this little attractive light blue beauty, with its yellow center. In the spring before last the author photographed an exceptionally fine plant, and the same is here reproduced natural size. It belongs to the Madder family. Structurally it is interesting from the fact that the flowers are dimorphous,—some having a long pistil and short stamens, the reverse being the case in other flowers. This arrangement prevents self-fertilization.

finest and most lovely wild flowers. A great many species thrive very well under the conditions just named.

Let us continue to bring wild flowers into our homes, for study as well as for the refining effect they never fail to have; but let us, too, in every way we can, discourage the wanton picking of them, especially the fatal practice of pulling them up by the roots.

PHILIPPINE ISLAND TIMBER

By ARTHUR F. FISCHER, *Bureau of Forestry, Manila*

AT different times in the past there have appeared in the various lumber journals of the United States articles to the effect that certain people claim or intimate ownership of large timber concessions in the Philippine Islands. As a matter of fact, about ninety-nine per cent of the standing timber of the Philippines is on public land and under the direct control of the Government. Extensive private timber holdings, such as are found in the United States, are unknown there; in fact, there is no inducement for any individual or company to attain such timber holdings under the present system of Government management of the timber lands. The Government develops the public forests under the license system, such licenses being granted for one year or for twenty years usually, the latter being the twenty-year exclusive license agreements, or concessions, as they are popularly known. All the larger lumber companies of the Islands are operating under exclusive license agreements and under such the company has the exclusive title (with the exception of the free use privilege) to the timber on the tract. The system means that if a prospective company shows sufficient good faith a concession is granted to the company, after the necessary advertising, etc., without the company having invested a cent in the timber. At no time has the company any money tied up in the standing timber, as the Government charges are only collected on the timber after it is cut. The enormous advantage of this system over private ownership is readily seen when it is realized that the money ordinarily tied up in standing timber can be invested in the logging and milling operations, while the company still has exclusive and full title to the standing timber, making it about as desirable as if the company owned it outright.

Details as to the obtaining of tracts of timber, location and areas of present tracts ready for development, capital required, and any other information along this line will be gladly furnished by the Bureau of Forestry at Manila to interested parties upon their request.

BOOKS FREE TO MEMBERS

An unusual opportunity to acquire some tree, bird and flower books free of charge is offered in a special announcement in the front of the magazine. These books are by experts on the several subjects and are not only desirable in any library, but of service in giving advice and instruction which will save the reader expense.

McALESTER'S LONE PINE

WHEN the street was paved in front of the Busby Hotel at McAlester, Oklahoma, someone with a kindly feeling for trees saw to it that this pine was spared. The tree stands in the middle of a wide street with ample roadway on either side and it is protected by a cement curbing and a wire fence stretched on iron posts.



A TOWN SAVES A PINE TREE

This stands protected by a high wire fence in the middle of one of the main streets of McAlester, Oklahoma.

There are thousands and thousands of more symmetrical pines in the forests that come to the very edge of this picturesque hill town in eastern Oklahoma, but this scragged veteran of the woods had prior rights that were respected. He was there among his own kind long before the foot of white man tramped over the McAlester ranch; he was there before the Choctaws came over from Mississippi under treaty with Uncle Sam. Nobody knows just how long he has been on that spot, watching the axeman strike down his fellows one by one. He saw the brick and stone buildings go up on Choctaw Avenue, at the foot of the hill, and when workmen broke ground for the hotel on the very street over which he was keeping his lonely watch he thought his time had come. When they began to lay brick on the kindly turf at his feet he gave up hope.

Suddenly he noted something unusual right down below his branches. A workman chalked off a ring and set a barrier of artificial stone against the paving that effectively kept his enemies at bay. And so he stands today a lone sentinel, a reminder of time forever gone, a refuge for birds, casting a slanting shadow to momentarily bless the passing wayfarer.

National Highways in Florida

BY MRS. KIRK MUNROE

THE great Dixie Highway, running south from Chicago for more than one thousand miles, finds its terminus in Dade County, Florida, at the boundary line between Miami and Cocoanut Grove. Throughout its entire length it has a reputation for beautiful scenery, carefully planned borderings of ornamental trees, shrubs, and flowers, as well as for smooth, hard-



ON THE INGRAHAM HIGHWAY

The famous Traveler's Tree (*Ravenala Madagascariensis*) of which there are many along the fine highway which runs one hundred miles into Florida until Cape Sable is reached.

surfaced road-beds, among the best of which are those found along its Dade County sub-division.

The unique slogan of the Dixie Highway, "Plant a tree for every baby along the line!" was first heard in Florida, and in that State it already has been answered by many miles of planted trees.

The Dixie Highway was officially opened on October 24, 1915, with a three days' celebration at Miami when the first automobiles to cover the entire route ended their long journey from Chicago.

One of the most notable features of this highway is a wonderful open-air Aviary and Bird Sanctuary, recently established by Mr. Charles Deering, of Chicago, on his southern estate that borders the road for miles just north of Miami. Here, too, also bordering on the Dixie Highway, Mr. Deering has deeded to the Government a large tract of land to be used by the Department of Agriculture as a tropical experiment station.

Ten miles further on the Dixie Highway finds its southern terminus at another beauty-spot, amid the superb collection of tropical flora displayed on both sides, for a

mile or more, by "Viscaino," the magnificent winter home of Mr. James Deering, also of Chicago.

At this terminus, the Dixie merges in the Ingraham Highway, the most southern road of the whole national highway system. Over its smooth, hard-oiled surface the traveler may penetrate nearly one hundred miles further, Uncle Sam's Mainland Tropics, until, at Cape Sable, he reaches their extreme limit.

This unique highway, bordered on one side by the Everglades, and on the other by the salt waters of Biscayne Bay, is named after the Honorable James E. Ingraham of St. Augustine, who discovered South Florida for Henry Flagler, and who has done more than any other one man



THE SCREW PINE (PANDANUS UTILIS)

These trees may be seen along both the Dixie and the Ingraham highways. On the Dixie the slogan is, "Plant a tree for every baby along the line!"

for its development. The highway that he explored traverses dark tropical forests, mangrove swamps, and crosses the vast saw-grass marshes of the Everglades. It passes orange, grapefruit, and lime groves, through others of avocados, or mangoes, besides great pineapple patches, and vast fields of tomatoes ripening in midwinter; also, and above all, it crosses "Paradise Key" through the superb Royal Palm Hammock, the great State Park that is maintained by the Florida Federation of Women's Clubs.

Half of this wonderful highway is already constructed, while the remainder, through the 'Glades, is under contract, with work on it in active progress. The road-bed is 24 feet in width and has a central driveway of crushed and heavily rolled rock, overspread with tarvia. When

completed, it will be bordered along its entire length with palms, and other tropical trees, interspersed with hibiscus, oleander, and other brightly blooming shrubs.

For its first thirty miles it traverses a section of country already cultivated and well settled. Here are located some of the finest winter residences with which people of



AT THE END OF THE DIXIE HIGHWAY

An avenue of Royal Palms (*Oreodoxa regia*) near where the Dixie Highway, after running 1000 miles from Chicago to Florida, is merged into the Ingraham Highway.

great wealth are beautifying this portion of the South, and all of these show picturesque gateways and carefully planted roadsides. Along the whole line, too, the beautiful wild life of the region, both animal and vegetable, is being conserved for the benefit of future generations.

The colors chosen for the great Dixie Highway are gold and white, and as the Ingraham Highway is under the especial protection of the Florida Federation of Women's Clubs, it is suggested that its colors shall be the same as theirs and that it shall evermore be known as the Road of the Gold and Green.

THIRTY-SEVENTH ANNUAL MEETING

The 37th annual meeting of the American Forestry Association will be held at Washington, D. C., on Thursday and Friday, January 18 and 19, 1917. All members are urged to attend. The program will be announced later.

SCHOOLS AND CAMPS IN FORESTS

INCREASING use of the National Forests for municipal camp sites and summer school locations is reported by the Forest Service. Permits have already been issued to several cities and educational institution and other applications are expected. Officials say that far more people use the forests for public playgrounds than for any other purpose, and that this use promises to be one of the most important to which they can be put.

The city of Fresno, California, has been granted a permit for the use of a 15-acre camp on the shores of Huntington Lake, in the Sierra National Forest. It is reported that the city will establish a camp in which outings during the summer months will be provided at low cost for 11,000 school children and their parents.

In the same Forest a California State normal school is now occupying a tract of land which is rented from the Government under a long-term lease. A number of buildings have been erected, all of which, as well as many cottages and camps, are supplied with water from a water system installed by the Forest Service. In connection with the regular six-week summer course, this school gives a course in woodcraft and general forestry subjects. The students visit the nearby Forest Service ranger stations and lookout towers, and study the Government's methods of fire protection. Addresses on the work of the Forest Service are given by officials from time to time. The Georgia State Forest School has a camp on private lands on the Georgia National Forest where a summer course is given. A feature of this course is a series of talks given by members of the Forest Service stationed in the vicinity.

Los Angeles was the first city in California to establish a vacation camp in the National Forests. A tract of land in the Angeles Forest has been rented, and a large camp built, costing about \$8,000. This camp consists of a log and stone lodge, 46 furnished cottages, tennis and croquet courts, baseball grounds and handball courts. A 10-day trip can be made for a small cost which is within the reach of practically every one. By this means thousands of residents of the city have been able to spend their vacations in the mountains.

It is also reported that a San Francisco association is considering the establishment of a summer home for girls at Lake Tahoe on the Tahoe National Forest. Boy Scout troops regularly camp in several of the forests, and on one forest the Y. M. C. A. of a nearby city has leased a lot and put up a permanent camp.

Officials say that the National Forests offer unlimited opportunities for summer school and municipal camps, as well as the best opportunities for recreation to be had anywhere in the country. Ample provision is made for campers and tourists. Hunting and fishing are allowed in season, and there are no restrictive regulations beyond those regarding forest fires.

Members are requested to use blank under table of contents if they wish sample copies of American Forestry sent to friends.

THE TREE THAT OWNS ITSELF

By T. H. McHATTON

Horticulturist, Georgia State Department of Agriculture

ONE of the most priceless possessions of the city of Athens, Georgia, is the tree that owns itself.

This fine, healthy, white oak, *Quercus alba*, is unique in being the only plant in the world that possesses a deed to the ground upon which it stands. There is no way



THE TREE THAT OWNS ITSELF

William R. Jackson of Athens, Georgia, in his will bequeathed to this fine old white oak entire possession of itself and the land for eight feet on all sides of it. Later, George Foster Peabody placed the granite posts and chains around it.

of telling how old this magnificent specimen is. The tree is 12.2 feet in circumference 5 feet from the ground, and about 60 feet high. In the days before the war Mr. Wm. H. Jackson used to climb the hill that this tree crowns and rest in the shade of its branches. From this position he could look out over his farm that stretched in the bottom below the hill, and there, it is said, Mr. Jackson spent a great deal of his time. When he died, in his will was found the following bequest:

"For and in consideration of the great love I bear this tree and the great desire I have for its protection for all time, I convey to it entire possession of itself and all the land on eight feet of the tree on all sides."

Of course, the laws of the State of Georgia would not permit a plant to be its own owner, but the beauty of the idea was accepted by the people of Athens and they are proud to say that they have in their midst a tree that is its own master.

Some years ago, Mr. George Foster Peabody had granite posts and chains placed about the realm of this forest monarch and caused to be engraved on a tablet

of stone the quotation from the will and the name of William H. Jackson.

Besides this unique tree, Athens has many other beautiful plants. The city has always been the educational centre of the State and in its younger days had many citizens like William H. Jackson, who recognized the worth and value and beauty of trees, and these men so impressed the community with their reverence for plant life that in its modern development the city has saved its magnificent forest specimens for the edification of future generations.

URGES HUNTERS TO BE CAREFUL

EMPHASIZING the destruction of property and human life caused by careless hunters, a warning issued by the Forest Service urges all sportsmen on the National Forests to use the greatest possible care to prevent forest fires and to avoid such accidents as the one which caused the death of Forest Ranger Clark on the Cabinet National Forest in Montana last year. Mr. Clark, it is said, was mistaken for a bear by a careless hunter who fired without waiting to be sure what he was shooting at. To show that such accidents are not uncommon, the warning quotes an estimate of the Biological Survey that between 150 and 200 persons are annually killed in hunting accidents in this country and that this number is increasing. Furthermore, it is stated, 15 per cent of all the forest fires in the National Forests are caused by careless hunters and other campers.

The National Forests, it is pointed out, contain the best hunting grounds in the country. The number of game animals is increasing on account of the protection from forest fires and illegal killing which is afforded by Forest officers. On many of the Forests, deer, elk, mountain sheep and other species are fairly plentiful, while small game is usually abundant. Bear, mountain lion and other predatory animals are found on most of the Forests and the killing of these meat eaters is encouraged because they prey on domestic stock and the herbivorous game animals.

The value of the Forests for hunting grounds depends largely upon whether they are protected from fire, says the warning. Forest fires destroy the range and breeding places of the game and often kill large numbers of the animals themselves, while a great many more are driven out of the country by the flames. Furthermore, streams flowing through burned-over areas are subject to such extreme variations of flow and are often so choked up with deposits of sediment that fish cannot live in them.

Each year, it is stated, sees an increase in the numbers of persons who visit the National Forests for hunting and other recreation purposes. Every effort is made to encourage this use of the Forests. Maps showing the recreation resources have been issued, and the trails built by the rangers open up new country to visitors.

The best indication of a man's fitness to be in the woods, the warning points out, is the care which he shows in handling fire-arms and fire.

White Pines Threatened

The White Pine Blister Rust Existing Menaces Trees Which are Request For Public Aid

THE American Forestry Association requests the coöperation of its members in the endeavor to prevent the spread of the white pine blister rust, which threatens the destruction of white pine and all five-leaved pines in the United States and Canada. This disease has already appeared in thirteen states in the United States and two provinces in Canada.

The chestnut blight is rapidly destroying all the chestnut trees in the United States because no serious attempt to combat it was made until it was beyond the possibility of control. The white pine blister rust threatens similar devastation of the white pines, but there is still time to save them from the fate of the chestnut, if decisive action is immediately taken. The loss of the chestnut is a disaster, but the loss of the white pine, because of its wide distribution, the immense present value of the timber and the great future value of the young growth, is an impending calamity, appalling to contemplate. The most hopeful feature of the situation is due to the peculiar fact that it is necessary for the blister rust fungus to pass one stage of its life on the leaves of currants and gooseberries. Since the disease cannot spread if currant and gooseberry bushes are lacking, the destruction of currant and gooseberry bushes of all kinds appears to be a practicable means of controlling the disease, if it is done before the pines become infected.

The estimated value of the white pine is as follows:

New England States	\$75,000,000.00
Lake States	95,000,000.00
Western States	60,000,000.00
National Forests	30,000,000.00

Experts believe that if the disease reaches the Pacific Coast that the western sugar pine will also be affected. The estimated value of this western pine is:

Western States	\$105,000,000.00
National Forests	45,000.00

The valuation of the pines which are threatened by the disease is, therefore: eastern and western white pines,

\$260,000,000.00; western sugar pine, \$150,000,000.00, or a total of \$410,000,000.00.

Vigorous and immediate action is necessary. If the disease can be stamped out, it is much easier and less costly to do it now than it will be when it has a wider area of infection. Neither state nor government authorities alone or together have the funds or facilities or the power to fight this disease the way it should be fought. Individual owners of timber lands, farm lands, waste-lands, owners of gooseberry and currant bushes, and the general public must be aroused to a realization of the danger and the damage threatened. Earnest public agitation in all the states where the disease has appeared is needed, and needed now.

The American Forestry Association will devote itself to the work of saving the white pine, and earnestly hopes that all of its members will coöperate in every way they can.

The white pine blister rust, as has already been explained in AMERICAN FORESTRY, appears as a fungus which is parasitic on white pine trees. In the latter part of May and early June the spores are spread by the wind to currant and gooseberry bushes. On these bushes they appear as a yellow rust on the under

side of the leaves, but do no damage.

Throughout the summer they may be spread by the wind from bush to bush, and in this way have been known to infect large areas, even traveling at times as many as twenty miles in one summer. From late June until the leaves fall, another form of spore develops on the gooseberries and currants, and this is spread by the wind back to the white pine, where the destruction is caused.

Because of the rapid spread of the blister rust and the great damage which it causes to one of the most valuable timber crops of the country, foresters agree that it is necessary to destroy all kinds of currants and gooseberries until the rust has been thoroughly stamped out.

Government and state experts have been in the field for some time making investigations of areas where the rust has appeared and also in examining gooseberry and currant

By Destructive Disease

in Thirteen States and in Canada Valued at \$260,000,000

in Preventing Its Spread

bushes and pine seedlings at nurseries, and their investigations have reached a point which now leaves no doubt of the grave danger of the disease or of the fact that it has already spread sufficiently to make the danger imminent.

The Massachusetts State Board of Agriculture recently invited State Forestry officials of adjoining states and government officials to meet at Fall River, Massachusetts, for the purpose of observing the effect of the blister rust on native pines in that locality, and to discuss methods of checking the spread of the disease.

Throughout all of this summer, it developed at the conference, scout work has been done in the six New England States and in New York, New Jersey, and Pennsylvania, which showed that in Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut, the blister rust disease is already thoroughly established on both imported and native trees. In certain sections of eastern New York and in portions of New Jersey and Pennsylvania, it has gained a foothold.

The result of the conference was that a committee representing the states of New York, New Hampshire, Vermont, Massachusetts and Rhode Island took immediate action in issuing a warning to the public which concludes with the following statement:

"The currant and gooseberry bushes in large areas throughout New England states and eastern New York are now infected with the blister rust in the stage when it returns to the white pine, and the immediate removal of currant and gooseberry bushes is necessary to save our white pine trees."

The United States Department of Agriculture, through the office of Forest Pathology, is coöperating in scouting for the blister rust in practically all the states where white pine is an important native tree. At the present time, scouting has been completed in but two states—Maine and New Jersey.

Seven points of infection were found in New Jersey; in five instances blister rust infection was found in commer-

cial nurseries, the remaining two cases being stock from the infected nurseries.

The situation in Maine is much more serious. The rust fungus has been found generally prevalent on currants and gooseberries from the extreme southwestern corner of Maine, about Kittery, to Bar Harbor, and throughout the territory northward to Rangeley, Greenville, and Millinocket. Wild growths of currants and gooseberries are found practically over the entire state on the roadsides, pastures, fields, swamps and rocky hillsides and comparatively level forest land.

Infected pines were found at Bar Harbor, Bath, Lewiston, Riverton Park near Portland, and Kittery.

There are enough wild gooseberries and currants in the State to carry the blister rust to every pine tree, and sweep out of existence the white pine forests of the state. What this means is evident when it is considered that white pine in the state is second in value to spruce; that the lumber it produces represents almost nine per cent of all the white pine in the United States.

The rust has also been discovered at nurseries on gooseberries and currants and white pine seedlings in other New England States, Pennsylvania, New York, Ohio, Indiana and in plantings of white pine in Wisconsin and in Minnesota, and there is practically no doubt but that the disease is making steady progress in all of the states mentioned in this article.

New York State has taken firm hold of the white pine blister rust problem in an endeavor to prevent the spread of the disease from the badly infected western part of Massachusetts. For this purpose an emergency loan of \$15,000 was authorized in August by Governor Whitman and thirty-five men under the supervision of the State Department of Agriculture and the Conservation Commission were set at work in Columbia County creating an immune zone two miles wide along the Massachusetts border by digging up and destroying all gooseberry and currant bushes, both wild and cultivated.

WHERE THE WHITE PINE BLISTER RUST HAS BEEN LOCATED

MAINE
NEW HAMPSHIRE
VERMONT
MASSACHUSETTS
RHODE ISLAND
CONNECTICUT
NEW YORK
PENNSYLVANIA
NEW JERSEY
OHIO
INDIANA
WISCONSIN
MINNESOTA
PROVINCES OF
QUEBEC-CANADA
OTTAWA-CANADA

Safety First in Tree Planting

BY PERLEY SPAULDING AND CARL HARTLEY

THE city man of to-day who buys a good apple wonders why it costs more than an orange. He used to buy apples for a fraction of their present price. He never can realize all of the reasons for this high cost until he visits a commercial apple orchard and sees the expensive spraying outfits and the hundreds of gallons of costly fungicides and insecticides with which the trees are sprayed during the early part of each season in order to protect the fruit from parasites. The amateur who tries to raise good fruit, or, in fact, any highly specialized crop, often is bewildered, if not beaten, by the variety of pests which attack his crops, the multiplicity of operations necessary to prevent or combat them, and the entire lack of efficient control methods for some of them. A very large part of the high price of food products is due either to the losses caused by insects and fungi, or to the expensive measures needed to prevent their attack.

This condition has valuable lessons for people engaged in other lines of work. The experience of the farmer will be of value for the tree planter if he will but read the handwriting on the wall and take heed thereto. Our forest trees are not now attacked by any such array of destructive pests as are cultivated crops. They never will be if we use proper caution now. Carelessness now is certain to result finally in putting the tree planter in much the same condition as are the fruit and truck growers now, and without one-tenth of their opportunity for effective control of established pests. An ounce of prevention now will be worth many pounds of cure later.

The imperative need for preventive measures and the methods of prevention needed will be best understood after a more detailed consideration of the crop disease situation. There

have always been diseases of crop plants. Before plant diseases were investigated, and we acquired our present exacting standards as to fruit quality, many cases of parasite injury went unnoticed or unrecognized. But we now have more trouble than we used to. Part of this is due to our modern extensive methods. A great part, however—

probably the greatest part—of our increased trouble is due to new parasites. Many of these we would never have had, if our fathers had been properly careful in their importation of plants. As a direct result of their heedlessness and ignorance of plant diseases we must pay a perpetual tax in the form of higher prices on everything we eat.

HISTORIC INVASIONS OF PARASITES

A list of a few historic invasions of parasites on agricultural plants may not be out of place.

1. Hollyhock rust. Introduced from Chile. Serious pest here, and has practically exterminated both the wild and cultivated mallows in certain sections of Europe.

2. Late blight and rot of potatoes. Probably from South America. Reached Europe and United States about 1835. Helped cause the great Irish famine, in which thousands of people starved to death. It reappears practically every year. The total annual loss is enormous.

3. Phylloxera and grape mildew. Both native of America. Devastated the vineyards of France and the Mediterranean about 1855, forcing great numbers of growers to emigrate. For some years they nearly destroyed the wine industry of Europe.

4. Asparagus rust. European. Reached America in 1896. Has driven out of cultivation the most prolific American varieties.

5. Citrus canker. Philippine. California prevented its entrance by its rigid inspection and quarantine. It has now obtained a foothold in the Gulf States. Florida is spending hundreds of thousands of dollars and destroying every tree affected with the canker, in an effort to

exterminate it. The entire citrus industry of the Gulf region is in great danger, however.

There have been many such outbreaks. These five are merely striking typical cases. All of these diseases are still present in their new homes, and always will be, with the possible exception of the last. Half a dozen dangerous new parasites have gained entrance in the last ten years.



From Bureau Plant Industry Bulletin, 263.

THE ASPARAGUS RUST

Field at right, healthy. Field at left, ruined by asparagus rust, introduced into the United States as a result of the unnecessary importation of plants from Europe.

In most of these cases, the parasite was relatively harmless in its own country, but when it reached a new country and found susceptible new hosts it attacked them with infinitely more vigor than it did its native hosts.

Large scale importation of forest tree stock has been a more recent development than that of fruit and orna-

conditions existing, however, its complete eradication is becoming more and more doubtful. If this effort fails, profitable forestation with any five-needed pine in any part of the United States will probably in time become impossible. Will attract general attention within 15 years.

4. The European hard-pine blister rust and the pitch-pine bud moth, recently discovered in imported material. It is hoped that the rust has been entirely eradicated; the eradication of the moth is very doubtful as it is widely distributed already.

The parasites we have already imported are merely samples of what we are likely to receive in the future, if we do not enforce efficient preventive measures. There are a number of known destructive pests which have not so far appeared in this country. For example, the oak mildew, which has greatly troubled European foresters for the past few years and appears to be a much more harmful parasite than our American mildew. The pine twister (*Caoma pinitorqua*) is another parasite even more to be dreaded than the blister rust. We should see that these and other known pests do not appear in the future. But more dangerous than the known harmful parasites are the hundreds of obscure foreign fungi, doing little or no damage in their native



Courtesy of Professor R. E. Smith.

WHAT ONE BLIGHT DID

This shows what the western pear growers had to do to save many of their orchards after they let the eastern fire blight parasite into the western fruit-growing regions.

mental plants. As a consequence, fewer forest parasites have reached us. But we have already had enough tree parasite invasions to give us stern warning of the danger. The following cases may be cited:

1. Gypsy and browntail moths. From Europe. Permanently established in New England and slowly spreading. Millions of dollars have been spent by the New England States, New York and the Federal Government in attempted extermination. This is given up and nothing is now attempted except the restriction of their migration and holding them in check by natural parasites. It took 20 years for the gypsy moth to attract attention.

2. Chestnut bark disease. Introduced from the Orient, almost certainly on nursery stock. Has already turned large areas of chestnut forest into waste land, and is steadily spreading. Probably will exterminate the present stand of American chestnut, despite earnest but spasmodic control efforts. Took 15 years for this to attract general attention.

3. White pine blister rust. Present in numerous importations from Europe. Thousands of dollars have been spent, and hundreds of thousands of trees and currant and gooseberry bushes have been destroyed in the effort to eradicate it. Scientifically this disease would not be difficult to eradicate. With the social and political



After C. L. Marlatt.

WHITE PINES KILLED BY THE GYPSY MOTH
Thousands of acres of forest have been wrecked by this introduced insect, and in 1907 Massachusetts spent \$750,000 in fighting the browntail and the gypsy moth in the effort to save the trees of the State.

habitats; some even entirely unknown to science, as were the chestnut bark fungus and citrus canker a few years ago. Any of these, when introduced into this country and given a chance at our great variety of forest trees, is likely to find a very susceptible host species which it

can entirely exterminate, as with the chestnut, or at least so injure as to destroy much of its commercial value. The virulence of such parasites cannot be foretold by the best informed plant pathologist in the world, because the effect of a new climate or of new hosts varies in each case.

MOVEMENT OF PARASITES

The problem of new parasites is by no means limited to importation from over sea. Great harm can result from the movement of a parasite from one part of the country to another. The history of crop pests here also contains valuable object lessons for the tree planter. The apple and pear furnish the best known examples. In the early days, fire blight, scab, codlin moth, and apple mildew were not present in the Northwest. The divides and deserts of the Rocky Mountain region presented a barrier which might easily have kept these diseases out of the Pacific Coast region for generations. Indiscriminate and



By courtesy of Cornell Agricultural Experiment Station.

SCAB DISEASE OF APPLES

This disease is prevalent throughout North America and causes an estimated annual loss of \$30,000,000 in this country alone.

unregulated shipment of nursery stock from the East to the West saddled the Pacific Coast with all the worst pests in a short time, and many of them became even more injurious in the western climate and conditions than in the eastern. This took place before the present efficient inspection service of California was fully developed.

From the pathological standpoint the forests of the United States may be considered as comprising three reasonably distinct regions; the East, the Rocky Mountain, and the Pacific Coast. Each contains some trees and parasites not present in any of the others. Both of the western regions contain parasites which have never had a chance to attack the eastern American tree

species, or the foreign species which have been introduced into the eastern United States. If the filamentous blister rust (*Peridermium filamentosum*) of the western hard pines and the very destructive leafless mistletoe (*Razou-*



Courtesy of Professor R. E. Smith.
PEAR BLIGHT ON PACIFIC COAST

What the pear blight did on the Pacific Coast, after the westerners allowed it to be brought to them from the East. The orchard in which this photograph was taken was completely ruined by the parasite.

mofskya spp.) which attack the western pines ever are introduced into the eastern region no one can guess how much damage they may cause. Recent inoculation experiments by Dr. G. G. Hedcock have shown that one of the most harmful of the leafless mistletoes of the West is entirely able to attack at least four of the species of pine grown in the East. In addition to these well-known parasites there are numerous less important or little known western pests which, if accidentally introduced to the East, might easily become very destructive.

On the other hand, some of the relatively isolated Pacific Coast tree species, growing in a climate especially favorable for fungus development, are likely to prove very susceptible to the parasites of related eastern species. Even such cosmopolitan species as lodgepole pine and western yellow pine have already shown themselves remarkably susceptible to the northeastern pitch pine blister rust (*Cronartium comptoniae*). Nursery stock of these species, raised in a Lake State's nursery where this rust is native, was much more seriously affected by it than are any of the eastern pines, being practically exterminated.

The white pine blister rust, which is very dangerously near to becoming permanently established in the East,

is certain to make trouble if it once enters the region of the western five-needled pine. It constitutes an additional reason for fearing the movement of parasites from East to West. The forester should profit by the costly lessons of the fruit grower, and take advantage of natural barriers to hold the forest parasites we now have to the regions they now occupy.

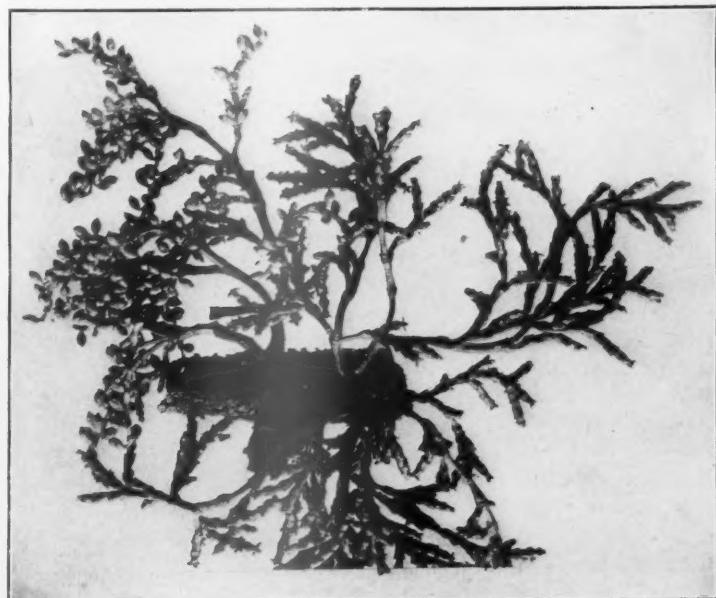
WHAT CAN BE DONE ABOUT IT?

Only a part of the pests we should fear have been mentioned in this article. The list of dangerous insects is particularly incomplete, as the writers make no pretense of entomological knowledge. But enough has been said to make it very evident that importation of additional foreign diseases, and the man-aided spread across the continent of parasites now limited to certain regions of our own country, is a serious menace to the future of American forestry. How then can we decrease this menace?

It is always possible for insects or fungus spores to be carried from one point to another on any commodity. However, plant parasites seldom invade new regions unless carried on or in some part of the plant they attack. With agricultural plants any part of the plant is likely to harbor a parasite, and exclusion of pests is therefore very difficult. With forest and ornamental trees the problem is easier. Very

method of long-distance transfer of tree parasites is on nursery stock, and in the materials in which that stock is packed.

The early attempt to prevent transmission of disease in nursery stock shipments was by inspection. Much dis-



From U. S. D. A. Bulletin 360.

KEEP THIS OUT OF THE EAST

The Pacific Coast yellow pine mistletoe, a very harmful western parasite, known to be capable of attacking eastern and European pines. Its seed may be carried on nursery stock from the West. Shipment of western stock to the East is therefore dangerous.



THE DEADLY CITRUS CANKER

Burning a diseased grapefruit tree with a crude oil blow-torch—the only method by which the disease can be killed without handling the diseased parts and spreading the infection.

few serious diseases of trees are carried in seed. Timber still bearing bark is capable of harboring many pests, but is not often shipped from one forest region to another except in the case of railroad ties and telegraph and telephone poles. This is a very efficient method of spreading the chestnut blight however. The principal

eased material has been kept out in this way, and great good has been done. But every one conversant with the situation realizes that inspection is only a partial safeguard. Blister rust and mistletoe may not show any conspicuous evidence of their presence on trees till two years or even more after infection takes place, so that stock carrying these parasites is very likely to pass as healthy. The most dangerous organisms, those which have not been serious pests in their native habitats, are still less likely to be caught by inspectors. Even so conspicuous and well known a disease as the chestnut bark disease can easily get past an inspector, as has already been too often proved. In the effort to meet this failing, the authorities have established quarantines against importations of certain plants. This improves the situation somewhat, but is also only a very partial safeguard. Following the American principle of allowing the maximum liberty of action, quarantines have been established only where the danger was positively known to be great and immediate. Most of the quarantines have not been instituted until the parasite concerned had already become established somewhat in the country.

It is therefore evident that present inspection and quarantine measures are inadequate. They do not by any means

assure us freedom from the introduction of new pests, although they do much to prevent their introduction. There is one simple method that will keep us free from new parasites. Tree planters must limit themselves to stock grown from seed in the region in which it is to be planted.

It sometimes happens that the use of home-grown stock will involve delay or even additional expense. The ounce of prevention may cost a little money, inconvenience, or time, but its cost is infinitesimal when compared with the cost of the many pounds of cure needed to merely keep a serious disease in check after it has once become established. With its great range of climate, the United States can grow from seed any species of any tree that can be grown here at all. The present disorganization of the import business offers an excellent opportunity for American nurserymen to make any needed preparation for supplying the entire home demand. There is no excuse, under present conditions, for us to continue dependent on foreign countries for any of our tree stock.

The lesson for the tree planter to take from the bitter experience of his brother agriculturists, then, is this:

In order to avoid further catastrophes like those caused by the chestnut bark disease and the gypsy moth:

1. Do not import nursery stock from any other continent.

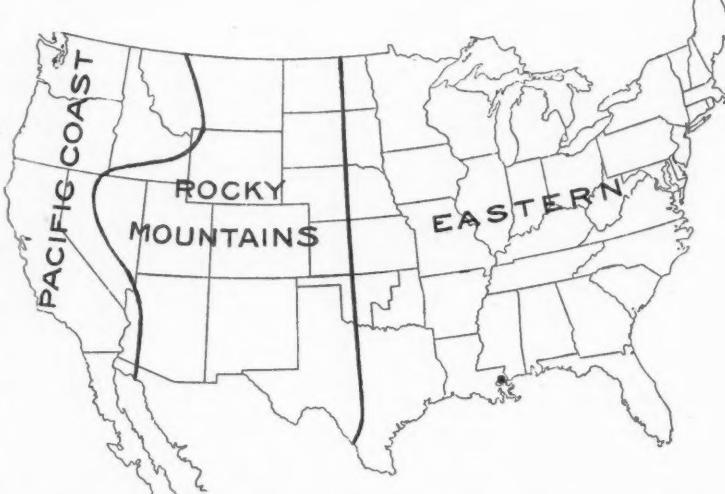
2. Do not ship stock or buy stock that has been shipped

across the regional boundaries shown in figure. Make sure that the stock you buy from your local nurseryman has been raised *from seed* in your region.

3. If it should be absolutely necessary to buy stock from a nursery in another region, choose a nursery that is in a farming community, in open rather than in forested country, and that raises its own stock from seed.

Our tree planters deserve great credit.

It is an excellent thing to make two trees grow where but one grew before. But the man who leaves a heritage of pests as well as of trees will deserve no praise from succeeding generations. The method of avoiding disease introduction by planting home-grown stock is simple and relatively easy. After the lessons we have already had, the establishment of a new tree pest in any part of the country is to be regarded as an avoidable calamity.



Each of the regions shown above contains dangerous tree parasites which should be excluded from the others. Shipment of nursery stock from any one of these regions to another is dangerous, even if the stock has been previously inspected.

FORESTERS TAKE BIG TRIP

AMES forestry students this summer took a three-months' trip through western and northwestern United States for the purpose of studying forestry. The party of fifteen consisted of forestry students and the members of the forestry faculty at the Iowa State College. The trip took the party through practically all the different forest regions of the west and northwest. Stops were made in Colorado, Utah, California, Oregon, Washington, Idaho, Montana and Minnesota. The longest camp, of three weeks' duration, was made on the Columbia National Forest in Washington, where unusually good opportunities were had for studying different lines of forestry work.

THE farm woodlots of the United States contain about ten per cent of the total standing timber in the country.

PLANTING ON HIGHWAYS

ARRANGEMENTS have been completed for coöperation between the Pennsylvania Department of Forestry and the State Highway Department in planting shade and fruit trees along the State highways. The Department of Forestry will grow the trees from seed in its big nurseries. They will be transplanted into areas set aside for the purpose, and when they have reached suitable size the trees will be turned over to the Highway Department and private good-roads organizations for planting.

THIRTY-SEVENTH ANNUAL MEETING

The 37th annual meeting of the American Forestry Association will be held at Washington, D. C., on Thursday and Friday, January 18 and 19, 1917. All members are urged to attend. The program will be announced later.

The Bird Department

BY A. A. ALLEN, PH.D.

Assistant Professor of Ornithology, Cornell University, Ithaca, New York

WHAT IS A GAME BIRD?

DURING the past few years the game laws of many states have been radically revised and the question of national and even international legislation for the conservation of game has been settled. There still remains unanswered, however, the fundamental question, What is a game bird? The federal migratory bird law and the game laws of each state of the Union define what are considered game birds within their jurisdiction but they are not identical. The laws of other civilized countries are

By the provision of the federal law and the recent treaty with Canada the following are recognized as migratory game birds:

(a) *Anatidae*, or waterfowl, including brant, wild ducks, geese, and swans.

(b) *Gruidae*, or cranes, including little brown, sandhill, and whooping cranes.

(c) *Rallidae*, or rails, including coots, gallinules, and sora or other rails.

(d) *Limicolæ*, or shore-birds, including avocets, curlews, dowitchers, godwits, knots, oyster catchers, phalaropes, plovers, sandpipers, snipe, stilts, surf-birds, turnstones, willet, woodcock, and yellowlegs.

(e) *Columbidæ*, or pigeons, including doves and wild pigeons.

Among the insectivorous birds, the federal law makes an exception of the bobolink, declaring an open season on it, thereby rendering it also a game bird, but the treaty does not recognize it as such.

To make the list of generally accepted game birds complete, the non-migratory species should be added so as to include the wild turkey, the various grouse, bob-white, prairie chickens, pheasant, and numerous species of quail.

If we should add all the species that have ever been considered game by any state legislature or by sportsmen in any part of the country, we should have to include blackbirds, bitterns, herons, grebes, gulls, terns, flickers, meadow larks, robins and many others. But we shall confine ourselves to those more generally recognized and analyze the reasons for so determining them.

When the laws of Italy permit the killing of all species of birds during the migrating seasons they define, thereby, a game bird as any bird large enough to eat, and the line is not drawn at sparrows and larks, for even the little warblers fall before the guns. When our forefathers had just settled this country, on the other hand, and powder was scarce, hardly any bird, except the turkey, was large enough or good enough to merit the cost of ammunition. During some recent explorations in South America, where true game birds are scarce, the author, on the contrary, sometimes descended to shooting toucans, or even troopials, and made his own definition of game bird according to the needs of the camp and the resources of the forest. But to-day, in civilized United States, we must look further than this food requisite when we are writing our definition.

According to Webster a game bird is a bird pursued by sportsmen, and a sportsman is one who is skilled in



A FLOCK OF WILD DUCKS, BLUEBILLS

These waterfowl seen on Cayuga Lake, New York, satisfy all the requirements of perfect game birds, except that they travel in flocks, thereby permitting more than one to be brought down by a single shot and yielding less sport per bird killed than the grouse, woodcock or snipe.

still different, culminating in those of southern Europe where every species of bird is legitimate game. But again there are many extreme bird protectionists in this country who believe that hunting is a relic of barbarism, its age passed, and that no birds should be hunted for food or for sport. The question naturally arises, then, What constitutes a game bird? Shall certain species continue to be hunted for food and sport, and if so which ones and why? Shall game birds be the same throughout the country or is there some reason for the differences in definitions other than the will of the sportsmen or the whim of the legislature? By the recent federal measure many states have lost some of their time-honored game birds while others have had offered them certain ones that they have long since repudiated. Let us see which birds are generally recognized as game, and if there is some logical reason for their selection.

the sports, such as hunting and so forth. This, therefore, takes us one step further, for it intimates that skill is required to secure a game bird. We have then, two requisites: it must be good to eat and it must require skill to secure it. Ideally, the game bird is extremely wary and difficult of approach, but when properly hunted,



Photograph by G. C. Embody, Ithaca, New York.

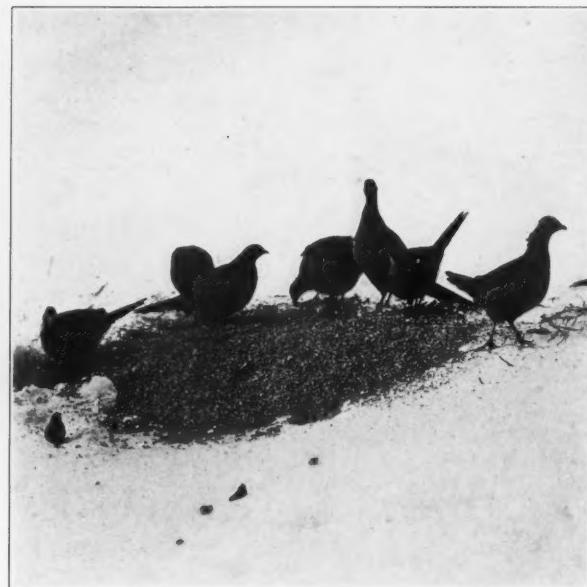
A NEST OF THE RUFFED GROUSE

Great fecundity and a faculty for avoiding its enemies are requirements of a game bird. In this ruffed grouse nest are twenty eggs.

it lies close and unseen by the hunter until flushed and then jumps with some startling noise and flies away swiftly. Thus it requires, on the part of the hunter, stealthiness, keenness, alertness, coolness, quickness, and skill in the manipulation of the gun. Edibility is not a sure prerogative in judging a game bird, for tastes differ; fish-eating herons are relished by some people and a man's appetite in time of stress would make even the proverbial "boiled owl" taste good. The requirement of skill is insufficient in itself, for some of our most valuable insectivorous birds, such as the nighthawk or bullbat, make very difficult targets for the gun. This, then, brings up a third requirement: a game bird must not be more valuable in some other capacity than as game, such, for example, as a destroyer of insects or a beautiful songster. The nighthawk just mentioned, the swallows, the robins, and the meadow larks, which were formerly shot by gunners in many parts of the country, are much more valuable as destroyers of insects than they are as food for the table or as targets for the hunter. The herons, which only occasionally are valuable as destroyers of insects and often are destructive about fish ponds and trout streams, add too much beauty to our streams and shores to be shot. Their aesthetic value outweighs their value as game, particularly as they are not very good eating and require but little skill in shooting.

Another requisite of a game bird is that it must have

a large reproductive capacity or a faculty for avoiding its enemies so that it can withstand legitimate hunting without serious diminution in its numbers. The greater the returns in actual sport afforded for the number of birds killed, the better is the game. Those birds which travel in compact flocks, like the ducks and many of the shore-birds, so that more than one can be killed with a single discharge of the gun, are inferior in this respect to the grouse, woodcock, or snipe which get up singly. To sum up, then, the perfect game bird is one that is valuable as food and of little value as a destroyer of vermin; one that



Photograph by G. A. Bailey, Geneseo, New York.

A FLOCK OF HEN PHEASANTS

The ring-necked pheasant, a native of China, has been successfully introduced into many parts of United States, and a valuable supplement to the native game. It satisfies all the requisites of the ideal game bird, except that it has considerable value as a destroyer of insects, and the cock birds are so brilliantly colored that they appeal strongly to the aesthetic.

is of little aesthetic value; one that taxes the skill of the sportsman to secure it, and one that is able to hold its own against hunting and all its other enemies. Let us see how well the various classes of birds withstand this examination.

First the *Anatidae*, or waterfowl, including the brant, wild ducks, geese, and swans. They are all, except perhaps the swans, excellent eating and a valuable asset to the national food supply. Secondly, it ordinarily takes skill to secure them. Although they become tame and unsuspecting where they are fed and protected, wherever they are hunted they are extremely wary and they fly with great swiftness. They are of relatively little value as destroyers of insects, are even destructive about oyster beds and grain fields, and, with proper limitation to the hunting, they can hold their own. In one respect, however, they are not ideal game birds because they travel in flocks and frequently many can be brought down with a single shot, or, where automatic and pump guns are allowed, often a small flock can be wiped out at one shooting. The laws of most states and Canada allow the

use of these guns and permit a person to kill as many as twenty-five or even more in a day. This limit was established in the days of unsportsmanlike market-shooting, when ducks were merchandise, not game, and there is no private family to-day that could consume such a quantity of meat. Until this limit is considerably reduced and automatic and pump guns debarred, our waterfowl are still in danger of extermination. One other argument is sometimes advanced against considering them as game birds because of the charm which always attends their presence on our waters. When spring shooting was allowed, there was considerable ground for this argument



Photograph by G. C. Embody, Ithaca, New York.

A BOB-WHITE ON ITS NEST

The bob-white is a perfect game bird in most respects, but its greatest value is as a destroyer of insects and a purveyor of cheer and inspiration in farming districts. It should be removed from the game list. The nest here shown is under a garden fence.

because of their striking and beautiful plumages and their curious and interesting antics or displays. But in the fall they are, for the most part, obscurely marked, and it is the impressive force of the well-formed flocks against the dark clouds and the wild sweep of their wings that charm us—a feeling that is only heightened by the knowledge that they are game—that one's skill can be matched against their wariness and their speed with the possibility of legitimate reward. Were they never hunted, they would become like domestic fowls, most of the charm would be lost, and they might even become obnoxious.

Less can be said for the second and third classes of game birds, including the cranes, rails, coots, and gallinules. That they are edible is perhaps true, although inferior to ducks, and the little sora and Virginia rails, that are often shot in numbers, are so small as to make scarcely a mouthful. About the only excuse for shooting them is that they do no particular good, living as they do in the marshes where few insects, except the mosquitoes,

are objectionable. It requires very little skill to shoot them because they flush quietly and fly weakly and usually permit such close approach that they are knocked to pieces by the shot. Gallinules are somewhat larger but equally poor flyers and are usually shot as they run over the water. The coot, however, is much more duck-like on the



A MOURNING DOVE BROODING ITS YOUNG

In spite of the fact that the passenger/pigeon has been entirely exterminated; showing that this class of birds cannot withstand hunting, the other species are still retained on the game list. Many states now give protection to the mourning dove and band-tailed pigeon, but the federal law and the recent treaty with Canada still classify them with the game birds.

wing as well as in its habits, so that there is some excuse for shooting it. Cranes are, of course, very much larger but they are rare everywhere, nearly exterminated by shooting in the east and one species (the whooping crane) is on the verge of annihilation throughout its range.

The fourth class, including the *Limicola*, or shore-birds, will answer to our definition somewhat better, although the smaller species of sandpipers and plovers have advisedly been removed from the game list by the federal law. Many of the larger species like the avocet and curlew are likewise protected for a term of years because they cannot stand the hunting and are rapidly being exterminated. The difficulty in their case lies in the fact that they travel in compact flocks and too many can be killed at a shot. The yellowlegs and the black-bellied and golden plover, which have been retained on the list, have survived the persecution somewhat better than the rest, but it would be much simpler and safer for all the shore-birds, as they are difficult to distinguish, if they too were removed for the period of ten years. The case of the snipe and the woodcock is slightly different for, although their numbers have been seriously depleted, under proper hunting restrictions they will be able to hold their own. They never travel in compact flocks and frequent much better cover than other shore-birds, the woodcock in the dense alder thickets and the snipe in the grassy marshes, and neither bird is often seen until flushed. Both fly swiftly and erratically, making a startling sound.

when rising, and taxing the skill of the hunter severely. Neither is of great value as a destroyer of insects because of the nature of its haunts, and neither is of great aesthetic value because it is difficult to see even when its haunts are known, and both are delicious eating. Both have suffered severely from prolonged shooting on their wintering grounds where they cling to one neighborhood until killed, but shortening the season and lessening the bag limit should permit them to hold their own.

The last class of the migratory game birds includes



A BOBOLINK IN SPRING ATTIRE

By the Federal Migratory Bird Law and many state laws, the bobolink is still considered a game bird, in spite of the fact that it is one of the greatest enemies of all the insect pests of the fields and at the same time is one of our most vivacious songsters. The bobolink in the photograph is feeding army worms and grasshoppers to its young.

it requires skill to shoot them, is undoubtedly true, if they are shot on the wing, because they are extremely swift. However, although they are not insectivorous, they do great good in the destruction of weed seed and they certainly have no mean aesthetic value, if we can judge from the inspirations they have given to writers and poets all over the world. Furthermore, pigeons or doves are not able to endure severe hunting, as attested by the total extinction of the passenger pigeon. The same fate is awaiting the mourning dove and the band-tailed pigeon, if they remain on the game list, but fortunately many states no longer regard them as such, giving them permanent protection, and the federal law has taken a step in the right direction by protecting the band-tailed pigeon for two years.

There remain for consideration the non-migratory game birds. The game quality of the wild turkey and the grouse is not open to question. They combine all the requisites which go to make up the perfect game bird. Excellent as food, the ruffed grouse, for example, will make a meal for two, or even three, persons; negligible or even destructive in its feeding habits, and of little

the wild pigeons and doves. That they are good to eat, there can be no question; that

aesthetic value aside from the charm which attaches to its gameness, it yields perhaps the greatest amount of sport per bird killed of any of our game, for it taxes the utmost skill of the sportsman when it thunders away through the dense woods. Where there is proper cover it will hold its own until excessively hunted and it increases quickly with the establishment of sanctuaries and although, as yet, it has not been artificially reared in numbers, the time will come when game preserves will be able to assist nature in replenishing the covers.

The introduced pheasant requires less skill to find and to shoot, has a somewhat greater value as a destroyer of insects and a more aesthetic appeal as it struts about the open fields, but unquestionably its greatest value is as a game bird, particularly as it is so easily reared artificially that covers can be restocked as rapidly as depleted. It is a valuable supplement to our native game.

The question of the friendly little



A FEMALE RED-WINGED BLACKBIRD

This bird shows very well the strong feet and the bill characteristic of the family *Icteridae*. The bird is at its nest in the reeds of the marsh.



A BALTIMORE ORIOLE

Although much more brilliantly colored, the orioles belong to the same family as the blackbirds. The bird is at its nest hung at the tip end of an elm branch.

bob-white and the various species of quails is not quite so simple. The bob-white has all the requisites of the perfect game bird in being excellent food, requiring skill to secure it, lying close at the approach of the hunter, rising with a startling rumble and flying very swiftly, and so forth. But, on the other hand, it is of great value as a destroyer of insects and has an aesthetic appeal quite aside from its desirability as game. Its cheerful whistle, its confiding ways, its pleasing appearance are all in contradiction to its use as a game bird. The same may be said of the California quails, scaled partridge, and all the other species. There is a considerable movement on foot to remove the bob-white from the game list, and it is not without reason, for we cannot say of it, as we can of the grouse, or the snipe, or the waterfowl, that its greatest value is as game or food for the table.

So much then for the birds that are usually considered game birds. Of the others which are sometimes or in some places so regarded we will consider only the bobolink upon which even the federal law places an open season. In the first place, is it good to eat? Yes, like the nightingale tongues of the ancient Romans, it is said to be quite a delicacy. In the second place, does it require skill to secure it? Emphatically no; the gunner merely shoots into a flock, flying or sitting, and chance rather than skill determines the number he kills. Have they any other value? Most assuredly, yes; while their fall plumage is nothing but an obscure yellowish brown and their song is silent, no bird is more beautiful or more welcome about clover fields in June. With his striking black and white markings and his rollicking song, he has inspired the poets and is the friend of all.

"Merrily swinging on brier and weed,
Near to the nest of his little dame,
Over the mountain-side or mead,
Robert of Lincoln is telling his name."

Again during the spring and summer the bobolink is almost entirely insectivorous and of great value in destroying grasshoppers, army worms, and other pests of the fields. The accompanying photograph shows the male bird near its nest and in its bill one can see two army worms and a small grasshopper, speaking for the inestimable value of the bird. We can truly say, then, that the greatest value of the bobolink is not as a game bird and that it should be removed from the game list. The same is true of blackbirds, robins, meadowlarks, flickers, and the majority of other birds, not already considered, that one occasionally sees listed as game.

In the December issue we will consider the propagation of game birds and see what it means for the game of our country.

The writer desires to state that as readers of AMERICAN FORESTRY frequently desire to ask questions regarding birds, he hopes they will not hesitate to do so as he will be glad to answer them. Inquiries should be addressed to the Editor of AMERICAN FORESTRY and a reply will be sent promptly.

The Blackbirds and Orioles

(Family Icteridae)

If birds were classified by their colors or by their habits, this family would have to be divided into many, so divergent are various members which compose it. There are over one hundred and fifty species in the family, all of them confined to the new world, but only nineteen are found north of Mexico. Some of them are dull-colored and some are very strikingly marked, but all are similar in having strong, perching feet, tails of twelve feathers, pointed wings, and bills that extend backward dividing the feathers of the forehead and leaving the nostrils exposed and not concealed by bristles. To this family belong the well-known blackbirds, many of which show brilliant red or yellow patches, the orioles, which are perhaps our most gorgeous birds, the black and white bobolink with his finch-like mate, and the aberrant meadow lark that has taken on the streaked back pattern of the sparrows and the terrestrial habits of the true larks. As a family they are nearly omnivorous feeders, taking seeds, insects, and fruits. During the summer they all feed upon insects and are extremely valuable birds, but during the fall the many species of blackbirds assemble in large flocks and often do considerable damage.

Of the blackbirds, the red-winged or swamp blackbird, the cowbird, and the grackle or crow blackbird are the commonest and the best known. The redwing hangs its nest in the bushes or reeds of the marshes but after the nesting season visits the upland in large flocks to feed. The female is streaked gray and black and lacks the scarlet shoulders of the male. The cowbird is found about pastures following the cattle. It builds no nest of its own, but, like the European cuckoo, lays its egg in the nest of a smaller bird and lets that bird hatch the egg and rear the young. The male is black with a brown head, the

female uniformly grayish. The grackle is larger than either of the two former, uniform black with metallic reflections and with a long tail that it holds boat-shaped when it flies. It walks around the lawns in our parks, nests in a variety of locations but more often in the tops of tall evergreens where also in the fall large roosts often assemble. During the spring and summer blackbirds are almost



A MEADOWLARK AT ITS NEST

The meadowlark is an aberrant member of the family, for it has taken on the streaked back pattern of the sparrows and the terrestrial habits of the larks. The meadowlark has the same characteristic bill as the Baltimore oriole.

entirely insectivorous and very beneficial, but during the late summer and fall, when they assemble in large flocks, they change to a vegetable diet and in some places do considerable damage to grain fields. For this reason they are not considered insectivorous birds by the federal law, the treaty with Canada, or most state laws, and are not protected.

The orioles are almost entirely insectivorous, although they are fond of fruit and sometimes do a little damage to cherries and early pears. They never travel in flocks, however, and the damage they do is negligible. The Baltimore and orchard orioles in the East and the Bullock's oriole on the Pacific Coast are the best known. They are noted for their deep, pensile nests, marvels of bird architecture. They have loud, ringing whistles that make our woodlands and shaded roads musical during the late spring and summer, but their song period is short and they are among the first birds to stop singing in July.

The meadowlarks and the bobolinks are perhaps the most valuable birds of the open fields and are worthy of every protection even though the bobolinks do assemble in large flocks on their migrations and do a little damage in the rice fields. The meadowlark has a loud, clear, plaintive whistle that varies in different parts of the country, while the bobolink gives us a rare jumble of whistles, warbles, and banjo-like notes that seem to fairly burst with exuberance as he hovers over the meadows.

On the whole, the family *Icteridae* contains some of our most brilliant, most musical, and most beneficial species whose structure and habits are so varied as to make them a most interesting and fruitful study.

FOR NEW YORK FOREST LANDS

THE Executive Committee of the New York State Forestry Association, at a meeting held at Albany, New York, urged every public-spirited citizen of New York State to approve the Meier \$10,000,000 referendum providing funds for the purchase of land in the Adirondack, Catskill and Palisade Parks at the November election.

The following facts were cited in favor of its adoption by the people.

1. The purchase of mountain land in the Adirondack and Catskill parks has proven to be one of the few profitable investments ever made by the Empire State since the present holdings could be sold for some five times the original purchase price.

2. The use of these mountain lands is of increasing value to the State, not only from the standpoint of recreation value, but also from their importance in conserving the run-off of mountain streams.

3. By properly and systematically locating the purchase areas, present holdings could be consolidated to a large degree. In addition, lands in danger of denudation or partially burned lands could be brought under State control and so handled as to make them an asset to the State.

Members of the Executive Committee, however, expressed it as their firm conviction that, in view of the possibilities of extensive land purchases in the Adiron-

dacks and Catskills, the Conservation Commission should enunciate a clear-cut policy for the management of forest land, both public and privately owned, with the idea of avoiding any possible hardships to present owners. They also stated it to be their belief that a thorough boundary survey and stock taking of the present holdings were extremely important, since such surveys in the past have been largely ocular estimates owing to the lack of funds, and which are likely to be only approximate.

PARENT NAVEL ORANGE TREE

WITHIN the beautiful grounds of the famous Glenwood Mission Inn at Riverside, California, is an orange tree which has had such a history as to warrant it a place among the famous trees of the country.

It is enclosed by an iron fence, with a curbing at the



THE PARENT NAVEL ORANGE TREE AT RIVERSIDE, CALIFORNIA
base, and the following tablet tells its story: "Washington
Navel Parent Orange Tree—From Department of Interior
in 1874—Replanted Here by President Roosevelt, May 8,
1903—Gift of Louis Jacobs."

Now that the navel orange has become such an important factor in the economic development of southern California, many people look with interest upon the original tree of the variety in its protected nook.

THIRTY-SEVENTH ANNUAL MEETING

The 37th annual meeting of the American Forestry Association will be held at Washington, D. C., on Thursday and Friday, January 18 and 19, 1917. All members are urged to attend. The program will be announced later.



SCENE IN DELVILLE WOOD, DEVASTATED BY THE WAR

A photograph showing the effect of intense artillery fire on forested land on the western battle front in Europe over which contending armies swept back and forth

There has been in this country much discussion upon the effect of modern artillery fire on forests in the European war zone, and the photograph printed here shows the frightful destruction wrought in thickly forested Delville Wood by bombardments which perhaps have not been excelled in intensity at any other point in the war zone. Delville Wood is on the Somme front and for the first two years of the war was held by the Germans. Like every wooded section along the battle front, it was subjected to frequent bombardment, as all woods so located serve as shelter for the movement of troops, the locating of guns and storage of ammunition. When the Somme advance of the Allies started, Delville Wood was one of the objectives of the British forces and against it powerful infantry attacks were aimed after several days of tremendous artillery fire.

Then ensued sanguinary struggles for possession of the Wood. British and Germans swept each other out of it several times. Finally the British retained possession and still hold the Wood. It was soon after they had gained it all that the accompanying photograph was taken.

As a shelter or a screen for artillery or infantry move-

ments it is now valueless. Not a tree remains whole, even the shattered trunks of but few remain standing. Trees were blasted into splinters by the explosions of the big shells and whole sections were mowed down by the torrent of fire which swept through them—but the photograph needs no word picture to describe it.

Most of the wooded sections along the battle line in France where contending armies have been in possession and which are exposed to daily fire are more or less in the same condition as Delville Wood. What has happened to the famous forest of the Argonne is described by Captain Granville Fortescue, formerly of the United States Army, and who is now in France, who says:

"Here and there a gibbet trunk still rises, a sort of skeleton tree standing as a stark symbol of the results of war. Scattered over the soil are rotting branches that bleach in the sunshine and the rain. The armies of France and Germany where they have pushed through this beautiful woodland are as the plague of locusts that sweeps through the green fields of grain in Argentina. Where the trench lines run, the trees, giant pine and stripling beech, have disappeared."

Forestry for Boys and Girls

by Bristow Adams

Chestnuts and An Old Story



CERTAIN little chap that I know very well, has a way of climbing up into his father's lap and putting this question: "Say, father, once-upon-a-time—what?" This poser is handed out when the small boy is likely to be tired or sleepy, and about ready for bed. Sometimes the old "once-upon-a-times" will do, but very often the start of such a one will bring a strong and firm reminder that the "Three Bears," or "Hop-o'-My-Thumb," or "Jack the Giant Killer" won't fill the bill.

So the father has to search around in his memory for a tale that will pass. Very often, after such a search, and after the yarn has been spun the small boy is fast asleep, long before the moral has been reached.

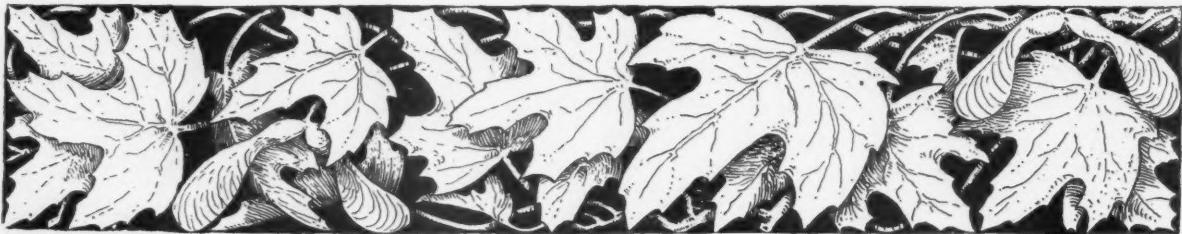
This night we were all rather tired. We had been out in the high winds of a crisp cold day, gathering nuts. The chestnut-bark disease has not reached our part of the country yet, and we have also many hickory and butternut trees. Wherever we had gone, a red squirrel had chattered at us madly, for all the world like a sewing-machine run wild. Even the squirrels had no better hoard for the winter than the one we gathered, though they can use many kinds that we do not eat,—as acorns and the seeds of spruce and pine. In the Southwest the Indians eat both acorns and pine seeds, and have winter storage places for acorns, from which they grind meal. They eat the sweet-kerneled seeds of the pinon, which are very good indeed, and much larger than our eastern pine seeds.

This time, none of the favorite old stories would do; after some trials to call to mind a story that would seem to be new, the fact that we had gathered chest-

nuts during the day gave the cue for the old story that follows:

ONCE upon a time, then—for that is the right way to start—there was a prince; and you'll find that most such stories can not get along very well without a prince or somebody of that sort. He was a bad prince. Ever since he was a baby he had been given his own way. He broke all his toys and he wasted his food; he threw horse-chestnuts, in season, at the palace hens; he whittled the legs of the parlor tables and chairs; and he tore his clothes and ground out the knees of his stockings faster than the queen-mother and all the ladies-in-waiting could darn them up again. As he grew older he threw his money away on foolish things that did him no good and even did him some harm. He spent his time with bad young fellows, and he would not learn to do anything useful.

The king, his father, grew very angry at this, and in the end he told the young man to clear out, to leave the palace and not come back. More than this, as was the custom of that time, the king put a curse on the youth by which he would not have any more things to waste. This was easy for the king to bring about, because he owned everything for miles around. So when he told the prince that he was not to use the crops of the fields, the king could see that this order was fully carried out. He made a good strong curse while he was about it, did the king, and besides the crops of the fields, the young man could not have the use of the wealth of the mines, or of the fish that swam in the sea or in the streams that flow down to the sea. The beasts of the earth and the birds of the air were also forbidden. He was a hard-hearted old king, and the prince had been a waster and a wild spender.



So the prince was cast out, but he went forth with his nose in the air. In the back of his head he had an idea through which he hoped to play a trick on the old man.

THEN what do you think happened? The king rode one day beyond the line that marked where the prince could not return, and there he found a great house, beamed with strong oak and paneled with fragrant cedar. Roofs were covered with shingles or with thatches of leaves; rich hangings were there, made of beaten-out wood fibers and dyed with the sap of other woods, like the tapa cloths from the South Sea Islands.

That night the king got a note asking him to visit this big wooden house; and the note, of course, was signed by the prince, as you have already guessed. This great house was the prince's new palace. The note paper was made from wood, just as this paper is, and the wording on it was written with a cleft and sharpened wooden stick dipped in ink made from oak galls. At first the old king thought that he would not go, but he wanted to see just what the prince had been able to do without running into any of the curses. So he made up his mind that he would go and would find out for himself how the prince had gotten around him.

When he got to the new palace he found that it was brilliantly lighted with the oil of tallow-tree nuts burning away merrily in bowls made of cocoanut shells, in which wicks of twisted wood fiber were floated by disks of cork made from the bark of the cork oak.

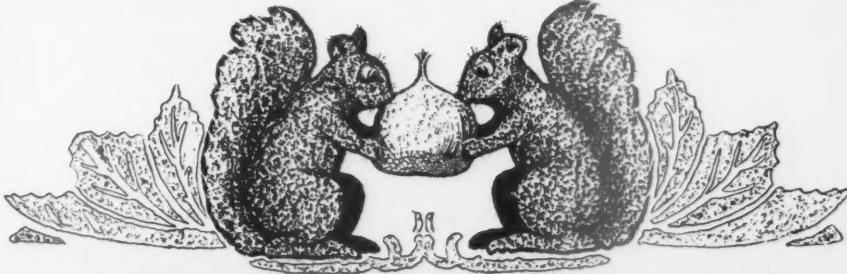
The tables were loaded with tree fruits. You can guess that there were

cherries, and apples, and oranges, and all such good things. But there was guava jelly, also, and roast plantains—somewhat like bananas,—and more kinds of nuts than you ever had at Christmas. Some were eaten raw, just as they were, and others were made into roasts or stews, exactly as you can find them to-day in the health-food eating-places. Besides chestnuts and chinkapins, pecans and hazel nuts, there were nuts from foreign lands. For example, there were the Brazil nuts, or "nigger-toes" that are packed every-which-way in a round hard husk. If you once get them out you can't pack them in again any more than the prince could get all the wheels back into the big clock on the palace stairs when, as a boy, he had taken it to pieces. Cocoanuts furnished milk and food besides, to say nothing of candy. Maple sugar was there in creamy chunks. For those who might like them there were betel nuts, pistachios, water caltrops, and cashew. The king hadn't even heard their names before.

He found some of these were very good, and he learned, while eating, that there were more kinds of nuts than he ever dreamed about. He nearly made himself sick from eating date-and-walnut loaf, it was so rich. He drank as much birch beer as if he had been a small boy at a New England circus. He ate persimmon bread for the first time, and he topped off on Chinese li-chi and pi-li nuts; but he did not much care for gingko kernels as a relish.

Musicians played soft-sounding wooden instruments,—the flute, the clarinet, the oboe and bassoon, and there were tunes on the xylophone, the very name of which means "the sound of wood."

(Continued on next page)



BEING quite full of food, the king was in a fairly good humor—for him. At first he chewed his whiskers a bit, thinking to himself what a chump he was to have forgotten and left out of his curse the great use of trees. Then he rather admired the prince for being clever enough to have thought of it, and to have worked out with so much skill the plan for the house and the big dinner.

Did the old king put his arms around the prince and say, "Bless you, my son; you have done nobly?" And did they make up and go back home together, and live happily ever after? No indeed, nothing so dull and tame as that. They still managed to fight now and then when they felt like it, and thereby to have just as much excitement as ever, but with a bit more respect for each other.

The prince mended his ways and, because the trees had been so useful to him, he spent the rest of his days in caring for them. He planted them and tended them, kept fires away and helped them to grow. Having something now in which he was interested, he found it easier to keep out of mischief. And he lived a long time to teach others the mighty use of trees, which the old king had forgotten all about when he made his list of forbidden items.

NOW the moral of this tale," I went on, "is that we must—" But looking down, I saw that the littlest boy was fast asleep. The tousled head was drooped and the brown little hands which had clutched some shiny chestnuts were unclasped, so that the nuts rolled down onto the floor when I lifted the lad and carried him up to bed. Anyhow, it won't hurt to keep in mind all the good things that the trees furnish us, and to try to do what we can to repay the trees by treating them well in turn.

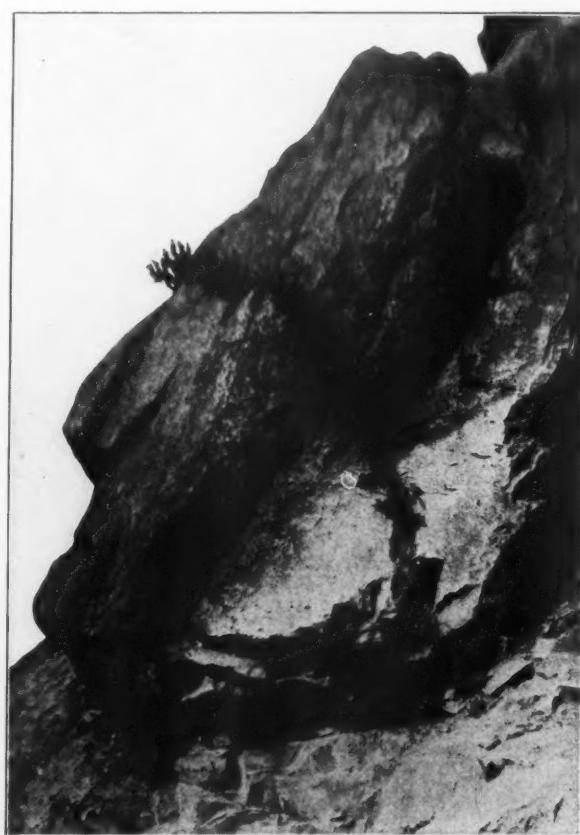
THE LASSEN VOLCANIC NATIONAL PARK

THE Lassen Volcanic National Park, the bill creating which President Wilson has signed, is California's fourth national park. Lassen Peak, which showed volcanic activity only a few years ago, was set apart as a national monument in 1906. Cinder Cone, in its immediate neighborhood, was also thus distinguished at the same time. The new national park includes both of these remarkable volcanic monuments within its area of 82,880 acres.

The region is one of extraordinary interest and the only one in the United States exhibiting recent volcanic action. Among its features are Lassen Peak, 10,437 feet elevation and still exhibiting some volcanic activity; North Peak, 8,600 feet elevation; Southwest Peak, over 9,200 feet elevation; Prospect Peak, over 9,200 feet elevation; Cinder Cone, 6,907 feet elevation; the Devil's Half Acre, showing hot springs and mud geysers; Bumpass, Morgan and other hot springs; seven lakes, many interesting ice caves and lakes of volcanic glass, numerous trout streams; and beautiful and majestic canyons. There are forests of yellow pine, fir, white pine, and lodgepole.

ROCK PROFILE OF WASHINGTON

THE illustration of a profile of George Washington seen in the gorge of the Natural Bridge of Virginia and published in AMERICAN FORESTRY for May has brought to AMERICAN FORESTRY photographs and stories



ROCK PROFILE OF GEORGE WASHINGTON

of several other profiles of the Father of his country formed by some scenic feature.

Among the most interesting of these is the accompanying picture of one of the best of the rock profiles of George Washington. It was sent to AMERICAN FORESTRY by Dr. Henry Sturgis Drinker, President of Lehigh University, who was for three years President, and is now a director, of the American Forestry Association. The rock is in the Lehigh University Park.

SHOE-BLACKING owes its peculiar aromatic odor, faintly suggestive of the deep woods where spruce or hemlock needles pad the ground, to an oil which is manufactured from these same kinds of needles. Similar oils are obtained from the foliage and small twigs of various cone-bearing trees, and find use for a number of purposes. In Europe the finer of these oils are used extensively as perfume in soap. They are common components of liniments and other medicinal preparations. Cedar oil is chiefly used in the preparation of insecticides, and, to some extent, in making liniment.

The Peak of Mount Russell

BY MARK DANIELS

We camped one night at Crab Tree Meadow. The air was crisp, and toward morning was cold enough to send little stinging needles through any part of the anatomy which might be protruding from beneath covers.

There was no indication of the likelihood of a mountain shower or thunder-storm on the sparkling morning which followed. As a result we all started early on a trip to scale Mt. Whitney, the highest peak in the United States.

About a half hour after we reached the summit, the storm clouds began to gather, and those of us who knew that the signs were portentous, immediately started a hasty descent. We were not quick enough, however, and were caught in a hail storm that bid fair to crush us to the ground.

Upon our departure from Crab Tree Meadow the little brook which traverses the open glade was but eight or ten feet in width. Upon our return it had swollen to fifty or sixty feet in width and to an unknown depth. The latter, however, we fathomed when we crossed it to reach our camp. With the sheer perversity of dumb things, the storm passed immediately we had reached our camp-fire and the sun, just setting, broke clear and bright through the clouds.

We were nearly frozen and as drenched as water-

dogs. It can be imagined, therefore, with what avidity we partook of a hot toddy and with what little care for the magnificent scene about us we went about drying our clothes as best we could. Some of us were partly clad, standing before a roaring fire and drying out what clothes we had, and our attention was entirely centered upon the work in hand.

Just before the sun was setting, however, one of the party glanced up and saw the peak of Mt. Russell illuminated with the golden rays of the setting sun. His exclamation diverted the attention of everyone and the scene which confronted us was one the glory of which drove all thoughts of discomfort from our minds.

The ridges in the foreground were in shadow and of a dark purple hue. The peak of Mt. Russell, seen in the distance, seemed to be of beaten gold, bathed as it was in the gold of the setting sun, whose rays struck it through another gorge behind the purple crags in the



Photograph by Mark Daniels.

THE PEAK OF MOUNT RUSSELL

The Peak is seen in the far background. In the foreground is Crab Tree Meadow and the scene is one of the many beauty-spots in the Southern Sierra.

foreground. It was like a monster nugget of pure gold framed in a setting of huge amethysts. We stood there spellbound until the last rays of the dying light disappeared with a suddenness that was like the snapping off of a dream of fairy-land, and returned to find that our roaring bonfire had paled to the dim glow of a firefly by comparison.

Ornamental and Shade Trees

A Department for the Advice and Instruction of Members of the American Forestry Association

EDITED BY J. J. LEVISON, B.A., M.F.
City Forester of New York City

WHAT WE CAN DO FOR OUR TREES IN WINTER

THE general feeling that one can do very little work on our trees during the winter is all wrong. One charged with the care of trees in a park, on city streets, or on a private estate, can do for them in late fall and winter almost as much as during any other period of the year and in special cases even more.

Let us see how this works out. When we deal with groups of trees, woodland groves or avenues lined with trees, we generally find some specimens badly infected with destructive bark beetles, borers and fungous diseases. If the trees that are hopelessly infected are marked (painting the trunk with white paint is a convenient way of marking) before the leaves drop, and removed and burnt before the following spring, the danger of infecting the neighboring sound trees during the spring and early summer is entirely eliminated.

In New York State, for instance, we are seriously troubled with the hickory bark beetle attacking the hickories, with the two-lined chestnut borer attacking oaks, and with the bronze birch borer on the birches. The removal of the branches and trees infested with these insects before May would eliminate the pests from the premises.

When trees die from old age, or from some special local cause, it is advantageous to postpone the removal of these until the winter.

Suppose your trees are infested with caterpillars, let us say the well-known Tussock moth, or the Gypsy moth, during the summer months. If so, you will find that these insects produce conspicuous clusters of eggs which adhere to the trunks and branches of the trees all fall and winter. Each of these egg clusters will produce hundreds of caterpillars if allowed to remain undisturbed after May. Is it not, then, preferable to fight our prospective crops of caterpillars by destroying in the winter time the egg masses which produce them? The egg clusters can be picked off or scraped off on canvas or paper covers spread on the ground and then collected and burned. The application of creosote to the egg clusters will also destroy them.

This is not all we can do in our dormant season. In the late fall we can fertilize the weaker trees, the shrubbery beds and the rare specimen trees with well-rotted manure. The manure should be dug in and mixed with the soil and should be concentrated near the tips of the roots rather than near the main trunk. A thorough fertilization of the trees in this manner will invigorate the trees and keep the tree doctor away.

The ideal material for invigorating trees in the manner just described is a compost consisting of manure, leaves and soil. Now is the time to form the compost and this will add another important undertaking for the late fall. The leaves raked from the lawns should not be burned. They should be collected and spread out on the compost pile. A layer of manure should be placed on top of the layer of leaves and a layer of soil over the manure. The process can be repeated several times until a suitable heap is formed. The compost heap may then be watered down thoroughly and turned over several times during the year. The material at the end of the year will be thoroughly decomposed and ready for use. Provision should also be made to draw off the surplus liquid manure so that it will not be wasted.

To those who still feel that they will not have enough work to keep them busy during the cold season, let me add such important items as cleaning out all cavities and decayed wounds of the trees and covering the exposed wood with coal tar. This is a necessary work wherever old trees exist, and one which can be done just as effectively in winter as in summer. If you have woodland to care for, there is plenty of opportunity to thin out the overcrowded trees, giving more growing space and light to the better species.

There is also room, in the winter time, for removing useless suckers from the old chestnut stumps and for encouraging the young seedlings in competition with others of lesser value. In face of these numerous undertakings that one can resort to during cold weather, there surely is no reason for the owner of trees to say that he cannot do effective work and equally as much in winter as in summer.

LANDSCAPE FORESTRY

R. B. MAXWELL, M. F., City Forester of Baltimore, Maryland, contributes to this department the following interesting defense of landscape forestry. He says:

"Is there such a profession as Landscape Forestry, or is the term a misnomer? Those of us who are arborists and landscape foresters believe that the science exists, but how are we to prove this, and to defend it against the attacks of those critics who claim the work to be a part of Landscape Gardening?

"As I see it, landscape forestry is forestry having as its aim the propagation and maintenance of woodlands

from the aesthetic viewpoint, rather than from the viewpoint of the commercial forester. It may very properly be included as a part of the broad science of Landscape Architecture. No less authority than the late Charles Eliot includes under landscape architecture the following branches:

"1. Landscape Gardening, that part of the general art dealing with improvement of the property immediately adjacent to the house. It includes lawn building, work with single trees, shrubbery, flowers, etc.

"2. Landscape Engineering, that part of the general art dealing with the proper and most pleasing location of roads, paths, bridges, water bodies, etc. The actual building of these may also be a part of landscape engineering.



Photograph by F. W. Besley.

THINNED FOR SCENIC VALUE

A stand of beech almost pure. This woodland has been thinned and improved, but not from the viewpoint of commercial forestry. An operation of this kind should properly be classed as landscape forestry.

"3. Landscape Forestry, that part of the general art dealing with the woodlands from the artistic viewpoint.

"It is not difficult to demonstrate that next to the topography itself, no feature of nature has such a decided influence upon landscapes as trees in woodlands. To prove this, let us consider flat and mountainous countries respectively, with, and without trees. The former without trees would be very uninteresting, the latter might be imposing, but hardly beautiful without tree-growth. Our critics will then say that true forestry is what we should practise. That is not true, for the commercial forester does not care whether his trees are spire-topped or round-headed. He does not care for foliage effects, or the presence of attractive tree flowers or fruits. In a well-ordered commercial forest, the forest floor is usually bare, and the tree trunks are tall branchless columns in tiresome repetition. In the commercial forest, the aim is for a full stand, and no gaps will be tolerated. The reverse of all of this is true with landscape forestry.

"What shall we call the art which directs the opening of tree-clogged views, or valleys? Surely some special knowledge of tree growth, habits, etc., is essential for this. It is hardly 'gardening.' Landscape gardening is not the science which directs the making of pleasant groves with turf-covered floors from the densest woodlands. Without a knowledge of thinnings, and the effect of changed light and moisture conditions, this operation would be a failure. The creating of an open 'park' within a forest cannot be attempted without considering



Photograph by R. B. Maxwell.

TYPE OF LANDSCAPE FORESTRY

This white oak grove, with its turf-covered floor, is the result of careful and judicious thinning. This is the remnant of a woodland, and is an example of what should be called landscape forestry.

the effect of this operation upon the adjacent remaining growth. Is this knowledge landscape gardening? Path and road building may be considered a part of landscape architecture, but when done in a forest it has a closer relation to the subject of forestry than to the gardening branch. If we could consider the drainage of a forest without reference to the effect upon the forest growth the problem would be one of engineering pure and simple. Water levels and moisture conditions cannot be abruptly changed in this manner without seriously affecting the distribution of plant colonies. This is landscape forestry and in no way related to landscape gardening. What directs the leaving or introduction of red and sugar maples, viburnums, wild cherries, and sassafras, on a sunny woodland border? These trees are not all desirable from the viewpoint of true forestry. Landscape gardening has little to do with encouraging dogwood, hemlock, and other

tolerant species in woodlands, or the planting of moist, low areas with the sweet bay or liquidambar.

"Probably no features add more charm to a woodland than streams and lakes. Streams must be properly directed, however, and formed into pools and spills. Their margins must be carefully treated with shade-loving 'woodsy' plants. Is this landscape gardening? The creating of a lake may flood an area and destroy trees. This condition must be considered and planting done to meet the changed water conditions. This is not landscape gardening."

"The use of trees for 'planting out' unsightly objects has long been a trick of landscaping. Where a large body

of woodland is needed for this purpose, however, the operation becomes landscape forestry. The same holds true for the 'planting in' of pleasant prospects. The treatment of woodland areas to encourage or discourage true woodland flowers is a part of our work. Some of these flowers, which are at home in the forest, but usually out of place in a garden or on a lawn, are: Hepatica, trillium, Solomon's seal, anemone, blood-root, partridge berry, azalea, rhododendron, and mountain laurel.

"With these considerations in mind, I trust we have established landscape forestry as a distinct profession entirely divorced from landscape gardening or other allied branches."

ADVICE FOR NOVEMBER

Advice upon what to do for shade trees and shrubs during November, sent by the American Forestry Association to its members, and available for any applicant for advice is as follows:

1. Prune trees and remove the dead branches.
2. Do whatever fall spraying may be necessary to overcome sucking or scale insects.
3. Prepare a compost of leaf mold in a mixture with manure and soil. This compost will prove of great value

in all planting and gardening work on your premises, as well as in rejuvenating impoverished specimen trees.

4. Prune the roots of trees which are to be moved during the winter; cut around the base of the tree and fill the trench with straw.

5. In especially exposed places, protect the rhododendrons and other tender plants and shrubs with evergreen boughs. Do this only where the cold and exposure make it absolutely necessary.

QUESTIONS AND ANSWERS

Q. Could you give me the name and a little information concerning the tree producing the enclosed leaf? The tree is growing in sandy soil in an excavation made for an aqueduct near my home in Aqueduct, New York. The enclosed is a comparatively small leaf, the tree producing much larger. The tree seems to be about four or five years old, and is perhaps three inches in diameter at the base. I have not seen any other tree of a like nature in the locality, hence my interest in the matter.

E. L. P., *Aqueduct, New York.*

A. The tree is of the variety *Paulownia imperialis*, or Empress of Japan. It is similar in leaf and flower to the catalpa, introduced into this country from China and Japan, and named for Anna Paulowna, a Russian princess, daughter of Czar Paul I. It occurs through southern New York and New Jersey, but is hardy as far north as New York City.

Q. I am enclosing a specimen of moss or scale from three species of the trees on our place that we prize most, viz., the red oak, wild olive and walnut. We have about five walnut trees, twelve large wild olives and four large red oaks in which we are seriously interested. A local, rather well-known expert in such matters predicts the death of all our large trees within five years, unless the scale is gotten rid of. After examination, if you can suggest a remedy it will surely be appreciated.

R. W. H., *Savannah, Georgia.*

A. With reference to your inquiry, I have a report from our expert on the specimens which you sent me, and I am glad to be able to tell you that it is of the foliose lichens. Neither it nor the moss you sent is parasitic, and the only known effect they may have on the tree would be a smothering effect. Neither is as likely to have as smothering an effect as the so-called Spanish moss, which does not seem to be concerned in this case. The most that you need to fear is a slight reduction in the vigor of the trees, and even this is not to be expected unless the moss is present in great quantity in the top of the trees as well as on the trunk.

Q. Being a member of the Association and a careful reader of the magazine, I wish to ask you concerning a maple tree which is in front of my house. I am enclosing a small sketch showing the elevation. My house is about six or eight feet above the state road, and between the first and second banking there is a large maple tree which shows signs of dying. The tree is directly to the north of the house and misses a lot of the sunshine, and also it is so placed on the banking that most of the rain water drains down into the road. What would you advise doing to prolong the life of this tree as it is a very valuable one to me?

R. M. M., *Webster, Massachusetts.*

A. I am much interested in your description of your maple tree and its location, and am glad to give you the best advice I can as to its care. Would suggest, first of all, a deep fertilization with well-rotted manure. Dig a trench around the tree about three or four feet away from the trunk. The trench should be three feet wide and two feet deep. Fill this trench with well-rotted manure mixed with good dark soil, half in half. In addition to this it is also well to vein the manure in narrow lines radiating from the trunk of the tree to the trench. In this way most of the roots will be fertilized and the ends of the roots will terminate in a rich mass of manured soil. The object of this work is not only to enrich the soil and the production of new and larger roots, but also to form a mulch which will retain the water and prevent it from draining to the road. Leaf mold, in combination with the manure, will help this mulching property. The running off of the water to the road may also be stopped by mixing considerable clay with the soil on that side of the tree which faces the road.

The following is quoted from a letter received from one of our readers:

"I have just been reading with considerable interest, your article in the July AMERICAN FORESTRY on Municipal Planting of Shade Trees. It seems to me that no one could find fault with

your conclusions, though, as a nurseryman, I might think that government competition with private business is not altogether fair. Surely there should be uniformity in street planting; my own street, with a mixture of sugar and Norway maples, elms and even Carolina poplars, is an example of the tree-seller's misguided efforts and the buyer's ignorance, while the *gymnocladus* in front of my own place, planted by a former owner, cause me daily to regret what I might have had. The bad effects of individual plantings have called for city action forbidding the planting of certain varieties.

"Recently, I read in one of the florist papers a correspondent's report from St. Louis that the Board of Aldermen of that city had passed an ordinance authorizing the city forester to designate streets requiring shade trees; to buy them and have them planted; the cost to be assessed as taxes against the owners of the abutting property. If true, that is rather advanced legislation, but very sensible, too. It is putting the matter of health and comfort from street shade trees in the same catalogue with lighting and paving and side-walks; and why not?

"Do you know if this is correct as reported, and do you know of any other cities doing the same thing?"

A. In making the suggestions to which he refers we were naturally speaking of conditions as they practically exist in a great many cities all over the country, and were recommending that cities specialize in trees such as oriental planes and maples, which they constantly need for replenishing their streets, and were not recommending that cities go into the nursery business with the idea of raising ornamental stock which requires a great deal of special care. We think that our cities ought to buy most of that stock, but we can see no harm in their raising such trees as we mention. In fact, we do not see how you can stop them, because they are already doing it to a great extent. One thing we can help a great deal is the close coöperation between city foresters and nursery men. As to the shade tree ordinance which you speak of, there is nothing new in that, and such cities as Newark, and East Orange, New Jersey, and 50 others throughout the country have done that years ago. We shall be glad, however, to have expressions of opinion on these points from other interested readers.—*The Editor.*

Q. I lost two large trees that had been bearing large, fine dark blue plums. I do not know the name of the variety. A dark, hard and warty growth appeared on the branches. It spread so far and fast, and filled and withered the branches and leaves to such an extent that I had to cut them down. I burnt them up for fear of the infection spreading. I find I have been a bit late in this, for on examination I see it exists to some extent on some of my other plum trees of Japanese variety. I am told the disease is called the black knot, but I should like to have full information as to what it is, how to check it where now existing, how to prevent its spreading, if it is necessary to disinfect and treat the soil, and I desire particularly to know if the pruning, if advisable, is to be done at once or when the trees have shed their leaves. At the latter time it, of course, is more apparent and a better and cleaner job can be done. I am sending specimens.

E. K., Little Boar's Head, New Hampshire.

A. The disease is the regular black knot of the plum, as you thought. It is caused by the fungus *Plowrightia morbosæ*. New infections take place in the spring and early summer, and the knots continue to grow throughout the growing period of the tree. By examination with a hand-lens, you will note that the surface of these knots is covered with innumerable round, blackish bodies, the fruiting bodies of the fungus. These, however, do not mature their spores until March of the following season. The work of eradication, therefore, can proceed at any time when convenient between now and next March, preferably after the leaves are off. On the larger limbs and branches make the cuts at least four to six inches below the knots, as the mycelium of the fungus extends a short distance beyond the swellings. It is a good plan to burn up the knots and then in bad cases to spray the trees with Bordeaux mixture before the buds swell.

Q. I am having at the moment great trouble with our pine trees. They have been perfectly healthy but are turning yellow, several have died already—all within the last month—four have gone entirely and others look "sick." There are no wild currant or gooseberry bushes near the trees. They are quite large trees. As the chestnuts died, we replaced them with pines, spruce, larch and maples, all of which trees do well here. We have many fine old hemlocks.

A. With further reference to your pine trees, I am able to tell you the opinion the laboratory has expressed relative to the condition. Judging from the specimens, it seems that this is a physiological trouble, probably caused by extreme weather conditions last winter, which have affected a small part of the sap-wood through which the water is conducted from the roots upwards to the leaves. The hot, relatively dry weather which we have had recently has resulted in a greatly increased demand by the leaves for water. Until this time, the sap-wood, only a part of which is affected, has been able to supply sufficient water, but this sudden, much increased demand has been greater than the diseased wood could supply. The result is a partial shortage among the branches, with the scorching appearing very suddenly. This is the way I have figured out the whole trouble from the appearance of sap-wood and all the other circumstances. It is a matter which is, at least with our present facilities, not possible for us to definitely prove by experiment. We believe, however, this is the truth of the matter. Records kept for several years upon diseased trees showed that most of them recovered the second year, and that only a relatively few died from the effects. So far as we can judge, there is no treatment which is likely to aid this trouble.

Q. Two of my Norway maples have died all of a sudden this fall. All the neighboring trees of the same variety are in good condition. I do not know how to account for it except that I placed some cotton dipped in kerosene around the trunk last spring and repeated it several times. My intention was to ward off caterpillars.

H. M., Hempstead, Long Island.

A. A continuous application of kerosene to the bark of trees is likely to do serious injury.

Q. What is the best way to seed a steep bank and what grass shall I use for my lawn?

A. L., New York City, New York.

A. If the bank is very steep, the safest way is to use sod instead of seed, or else it will wash down before the seed is established. For the lawn the best seed would be a combination of equal parts of fescue, Kentucky blue and creeping bent. You might also introduce a very small quantity of small-leaf white clover.

Q. My hickory trees have turned brown within the past few weeks and many of them look entirely dead. Can you account for it? Will they come back again next year?

W. S., Waterbury, Connecticut.

A. Your hickories have evidently been killed this year by the hickory bark beetle. You should have that determined definitely, and, if so, the infested trees should be cut down and burnt before May. They will never come back to life.

Q. I want to set out some nice hybrid rhododendrons this fall. What are the best varieties?

R. H. L., Orange, New Jersey.

A. This is not the season for planting rhododendrons. Spring is the best time. The following varieties are good: Kettle drum, Abraham Lincoln, H. W. Sargent, General Grant, Everstriatum, Charles Dickens, Lady Armstrong, Parsons grandiflora, etc.

Across the High Sierras

BY MARK DANIELS

FLORENCE PEAK is really the outpost on the trail across the high Sierra which marks the entrance to another land where proportions are strange and different. It is a mass of disintegrating granite about the base of which are rugged fields of talus and mile-long slopes of granite sand.

At its base nestles Franklin Lake, a sapphire sheet of crystal water fed by the melting snows on the north side of the peak.

The trail leading to Franklin Pass, which is to the left of the Peak, passes through some strange and weird scenes which are well calculated to put the traveler in the proper frame of mind for appreciating the scene from the summit. There are several groves of foxtail pine whose russet trunks and spectre-like branches, when silhouetted against the western sky, seem to speak of an austerity that shall fall upon him who travels their way, like the pall of a shroud. The entire landscape above the timber line is one of magnificent desolation and tremendous distances. From the summit at the Pass, the Great Western Divide bursts upon the view with shocking suddenness, and beyond it can be seen the real divide which constitutes the crest of the high Sierra. There are few passes in the

western mountains from which so commanding a view can be had as from Franklin Pass on the northern shoulder of Florence Peak.

The district surrounding Florence Peak is exposed and barren granite which reflects the light in all directions. If one is to travel for any length of time in this kind of country dark glasses are almost as necessary as in traversing snow-fields. John Muir named the Sierra Nevada "The Range of Light." He was prompted to do so by the strange diffused light that is ever present in the daytime in districts similar to the Florence Peak country. The face of the cliff shown in the picture is in deep shadow, yet there is sufficient diffused light to bring out all of the detail on a photographic plate.

The trail swings off to the northeast from Franklin Pass and traverses several miles of shifting, coarse, granite sand before it drops into the head-waters of Rattlesnake Creek. From the latter

point on, until the break of the Great Kern River Canyon is reached, the trail lies between towering walls of granite almost identical in character to the north side of Florence Peak, and even in the shadows beneath the trees, the amount of diffused light is quite apparent.



Photograph by Mark Daniels.

FLORENCE PEAK ON THE GREAT WESTERN DIVIDE

It is a bit confusing to find this peak and adjacent ones named as part of the Great Western Divide, but that is what they were called before the higher crests of the Sierra Nevada were discovered.

Do Ants Kill Trees About Their Colonies?

By R. C. HAWLEY AND S. J. RECORD

DURING the past few years the writers have had occasion to note the death of young trees in the vicinity of ant hills. As the type of injury is practically the same in every case, and has never been found except in association with ant colonies, it is assumed that the ants are responsible, directly or indirectly, for the damage. Observations have been made on more

than sixty ant hills about New Haven, Ansonia, Middlebury, Union and other parts of Connecticut and in Pike County, Pennsylvania. The same trouble has been reported from other portions of Pennsylvania, Massachusetts, New Hampshire and New York.

The insect in question was, in all cases but one, the mound-building red ant, *Formica exsectoides* Forel. The



KILLED BY ANTS

Section through a young white pine showing girdling due to the ants and continued growth above it. Most of the dead bark covering the injured portion was broken off in handling specimen.



FORTY TREE CASUALTIES AROUND AN ANT HILL

Around the ant hill seen in the photograph, and located near New Haven, Connecticut, forty white pine trees have been killed or injured.

apparent exception was one low, flat mound in which the only ants observed were the common black, *Formica fusca* Linn. var. *subsericea* Say. Since, however, the red ant is parasitic on the black, it is not improbable that even in this case the red ant was responsible for the damage done. This view is strengthened by the fact that inspection of a considerable number of other black ant nests has revealed none of the characteristic injury to tree growth. In a few cases colonies of a dark-colored aphid tended by ants were found on trees near the red ant nests.

Most of the damage noted has been to white pine (*Pinus strobus*), from a few to fifteen years of age. Other species observed by the writers to have been affected were Scotch pine (*Pinus sylvestris*), red cedar (*Juniperus virginiana*), American aspen (*Populus tremuloides*), shag-bark hickory (*Hicoria ovata*), gray birch (*Betula populifolia*), Bear oak (*Quercus nana*), and Staghorn sumach (*Rhus hirta*). The effects are most noticeable in pine plantations and in openings in the high forest where young trees are coming in.

The areas of infection are irregularly circular, and the radius within which trees are damaged about each ant hill is subject to considerable variation, reaching a maximum of 25 feet, with an average possibly of about 10 feet. The largest number of trees noted, killed or attacked about a single colony, was 40. Where ants are abundant the loss may be very considerable. In one white pine plantation of about a quarter acre near Union, Connecticut, fully

75 per cent of all the trees had been killed. Since these ants are common throughout the northeastern United States, particularly on the class of lands ordinarily reforested, the importance of the danger is evident.

In the case of white pines the injury is first manifested by a slight yellowing of the foliage which gradually increases until the tree dies and the leaves turn brown. Examination of a dying or recently dead tree shows a constriction of the trunk extending from 1 to

2. The immediate cause of the death of the trees is not yet understood. Dr. A. H. Graves² believed it to be due to a fungus, but was unable to substantiate this belief. Inoculation of healthy trees produced only negative results. No fruiting bodies on the injured areas have been observed by the writers, and the range of species attacked seems too great for a single fungous disease. If fungi or bacteria are responsible, the only plausible means of dissemination is through the agency of the ants. There is no evidence that the damage spreads from tree to tree.

3. From the appearance of the specimens examined by the writers, the death of the trees is not attributable to mechanical injury to the bark from the biting of the ants, as there are no evidences of girdling from the outside. That the trouble is not due to soil-poisoning or damage to the roots is indicated by the nature of the injury and its localization.

4. The only apparent means of combating the trouble is to destroy the ant colonies. Experiments are now in progress to determine the best means of accomplishing this. Carbon disulphide and naphthalene flakes may prove efficacious if properly administered. In order to avoid loss of young trees, the work of extermination should be done prior to planting. Otherwise it is advisable to leave unplanted a circle at least 20 feet in radius about each colony of *Formica exsectoides*.

DOUGLAS RODMAN DEAD

Douglas Rodman, a well-known forester, died suddenly of heart failure in Butte, Montana, on July 6th and was buried at Frankfort, Kentucky, the city where he was born on March 22, 1882. After preparatory schooling in Kentucky, he studied under Dr. Schenck at Biltmore, graduated there and entered the Forest Service. His first detail was to Manitou Islands, after which Mr. Pinchot sent him as ranger to the Gila Forest Reserve in New Mexico. Here his energy and ability were soon recognized. He was made assistant forester and then chief forester over this difficult and large reserve, and finally succeeded to such an extent as to secure Mr. Pinchot's high commendation. Mr. Rodman resigned from the Forest Service to make general forestry and mining investigations in the Pacific Coast states and Alaska. He was for several years in charge of forest engineering for the C. A. Smith Company at Marshfield, Oregon, introducing scientific forestry into this large operation. Mr. Rodman was a man of high enthusiasms and warm friendships. In his wide traveling and experience he made many friends over the country who will grieve at his death while still in his active years.

5 inches just above the ground line and with a decided swelling at the upper margin. Upon removal of the bark, the cambium layer is found to be girdled as by a canker, while the swelling above the injury is due to callous and continued growth of the stem in diameter for two years or so after growth below ceased. Above the seat of principal injury is to be found a considerable number of small depressions in the bark which extend up the trunk from a few inches to two feet or more. On living trees ants have frequently been observed about fresh injuries to the green bark. These patches later develop a corky layer and produce the characteristic dark pits referred to above. Instances have been observed where partially girdled trees have recovered.

The conclusions to be drawn are therefore:

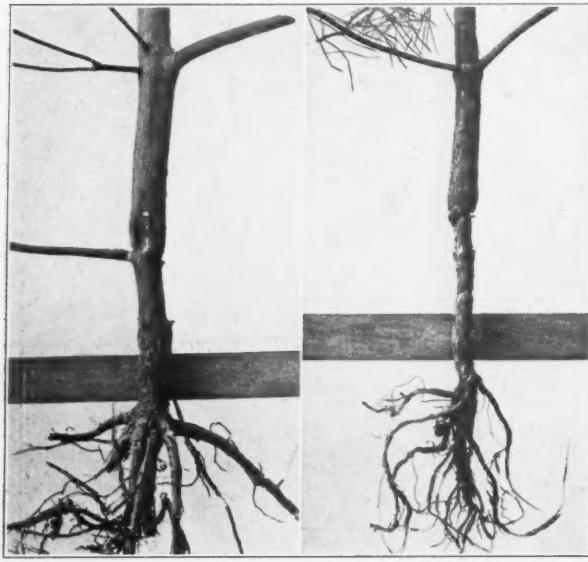
1. The ants are responsible¹ for the death of the trees, as in no instance has this particular trouble been observed except in the immediate vicinity of ant colonies. It appears to the advantage of the ants to kill vegetation which otherwise would shade the colonies too much. The damage is most noticeable in plantations presumably because ants are most abundant in open areas.

¹ This conclusion is drawn in spite of the fact that ants have not previously been considered enemies of trees. Heretofore they have been classed as beneficial on account of destroying large numbers of insects.

THIRTY-SEVENTH ANNUAL MEETING

The 37th annual meeting of the American Forestry Association will be held at Washington, D. C., on Thursday and Friday, January 18 and 19, 1917. All members are urged to attend. The program will be announced later.

² A preliminary note on a new bark disease of the white pine Mycologia, vol. vi, No. 2, March, 1914.



NO. 1.

NO. 2.

No. 1.—Young white pine, near New Haven, Connecticut, showing characteristic constriction just above ground line which is indicated by the upper edge of ruler.

No. 2.—Young Scotch pine, near New Haven, Connecticut, killed near ant hill, showing prominently the callus and increased growth above injury.





A New Method of Germinating Acorns for Forest Planting

BY JOHN W. HARSHBERGER, *University of Pennsylvania*

THE trained forester is always alive to new methods by which the objects of his profession may be reached by the easiest and most satisfactory methods. An important question to the forester is the collection, preservation and germination of the fruits and seeds collected by him to establish his forest nursery, and the methods adopted by him toward this end have been elaborated in great detail. The proper preservation of nuts, acorns, other seeds and fruits over winter has always been a difficult matter, for the germination of the seeds must be kept unimpaired during the cold and frosty period of the year.

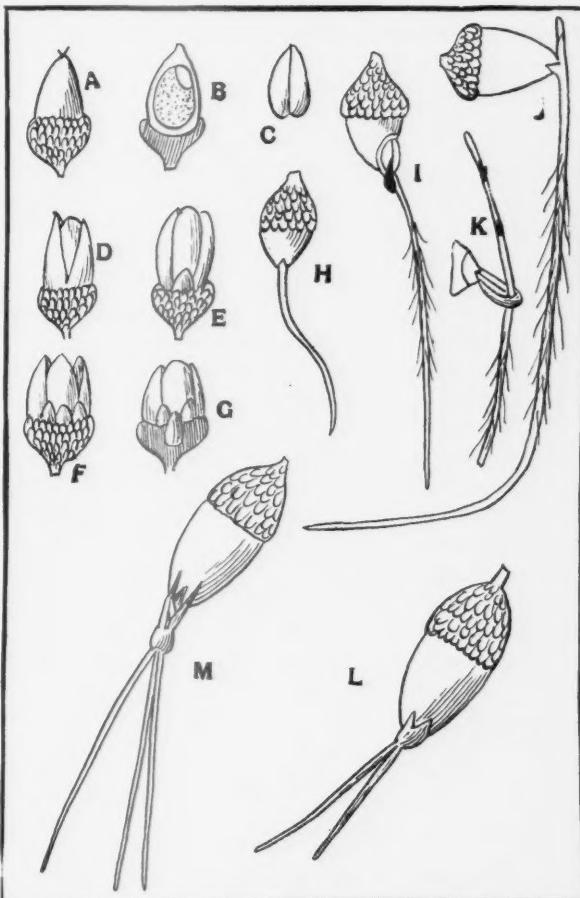
A new method of treating one class of these fruits, acorns, was discovered in an accidental way by the writer about two years ago, and a description of the method may prove of interest to the readers of AMERICAN FORESTRY. In order to acquaint myself with the method used by the Pennsylvania forester, I wrote to Professor Joseph T. Rothrock, of West Chester, asking him what method he had used in the preservation of acorns over winter. In reply he stated that his observations had been made on a scale of but a few thousand.

His method was as follows: ordinary strawberry boxes were taken, holding one quart, and the acorns to be kept over winter were placed in them, layers of almost dry earth alternating with layers of acorns, until the boxes were filled. These strawberry boxes, filled with acorns and earth, were then put in a larger box, so that the smaller boxes were piled one above the other. Over the retaining box, a still larger box was turned upside down as a cover, and over these boxes earth was shoveled until they were entirely covered, so as to keep out rain and cold. This cache was then opened in the spring and the sprouting acorns were removed and planted. Dr. Rothrock also described a method of planting the acorns in the fall, covering them with a layer of leaves, and just enough earth to keep the leaves from blowing away. This should be done in well-prepared ground, so that the seedlings can make a rapid growth in the spring.

Guppy, an English botanist, has demonstrated that the acorns of the red oak actually germinated on the tree, thus showing vivipary, and this growth continued on the tree after the pericarp, or fruit case, had commenced to dry and lose weight. He demonstrated that ripe acorns are able to proceed at once to germination, if placed under conditions inhibiting the glazing of the fruit wall and the drying of the fruit. On September 17, 1908, he collected ripe acorns and placed them in damp moss in a warm cupboard. They were still biologically connected with their cupules, and their shells, though beginning to brown, were still thick and moist. Within eight days he found

some of them germinating normally, and one of them, when planted, grew healthily under protection during winter. He repeated this experiment with green, ripe acorns, showing no signs of dying, and possessing, as in the first case, entire shells. In five days half of them had split their shells and in several the radicle protruded.

After having read this account, the writer found, on



A. Acorn of Black Jack oak. B. Acorn of Black Jack oak dissected. C. Embryo Black Jack oak. D. First stage of vivipary in acorn of Black Jack oak. E, F, G. Later stages of vivipary. H, I. Stages in germination of green acorns of Black Jack oak. J. Stage in germination of green acorn of white oak. K. Detail of the germination of the acorn of white oak. L, M. Germination of green unripe acorns of white oak.

September 5, 1912, a viviparous acorn at Spring Lake, New Jersey, on the Black Jack oak. This state was probably induced by preceding heavy rains, followed by mists and fogs. The examination of this acorn (Figs. A-G inclusive) showed that the embryo had swollen sufficiently to crack open the acorn wall. This suggested experiments with a number of acorns from American oaks to test the discoveries of Guppy with reference to the germina-

tion of the English oak. Acorns from the white oak, chestnut oak, and blackjack oak were planted in a box in sphagnum moss on September 12, 1912, and the results recorded on October 22, 1912. Two series of green acorns were sown. One set had a portion of the shell removed, exposing the embryo. The other set was planted with the acorn shells unimpaired. There was a slight advantage in the rate of germination of the cut acorns, as contrasted with the uncut. Practically all of the green acorns of the chestnut oak, blackjack oak and white oak germinated without passing through a dormant period. In fact, the dormant period is not necessary for acorn germination, although Sachs¹ has maintained that even under the most favorable conditions dormant periods occur in the lives of plants and although the external factors are favorable, every extremely perceptible vital manifestation ceases, and it is only after more months of rest that the growth commences anew, and this frequently under circumstances which appear far less favorable, especially at a conspicuously lower temperature. This has evidently been the philosophy under which foresters have layered their nuts and acorns for their preservation in a viable condition through the winter. The practice under these conditions has been described previously as practised by Dr. Rothrock.

The experiments narrated above show that a rest period is not essential for the germination of acorns, but that by taking immature acorns, whose embryo has not ceased to grow, and planting them, the period of growth is maintained without cessation, or without a rest period, and the result is the elongation and growth of the embryo into a young seedling plant, as fully demonstrated by the figures (H-M).

The germination capacity of so-called unripe seeds does not seem to have been appreciated by foresters and gardeners, who layer their tree seeds in boxes of sand, kept slightly moist, and kept in a cool, protected place over winter. That the acorns can be planted, while green, in protected frames and carried over the winter in the frame, or cool greenhouse, in the actively growing condition, and planted out in the spring, should be a boon to the forester, who has been troubled with the successful preservation of the acorns over winter. A practical trial of this new method on a large scale should be made at some forest station in the United States.

¹ Sachs, Julius. *The Physiology of Plants*, 350.

FUEL VALUE OF WOOD

THE fuel value of 2 pounds of wood is roughly equivalent to that of 1 pound of coal. This is given as the result of certain calculations now being made in the Forest Service laboratory, which show also about how many cords of certain kinds of wood are required to obtain an amount of heat equal to that in a ton of coal.

Certain kinds of wood, such as hickory, oak, beech, birch, hard maple, ash, elm, locust, longleaf pine, and

cherry, have fairly high heat values and only one cord of seasoned wood of these species is required to equal one ton of good coal.

It takes a cord and a half of shortleaf pine, hemlock, red gum, Douglas fir, sycamore, and soft maple to equal a ton of coal, and two cords of cedar, redwood, poplar, catalpa, Norway pine, cypress, basswood, spruce, and white pine.

Equal weights of dry, non-resinous woods, however, are said to have practically the same heat value regardless of species, and as a consequence it can be stated as a general proposition that the heavier the wood the more heat to the cord. Weight for weight, however, there is very little difference between various species; the average heat for all that have been calculated is 4600 calories, or heat units, per kilogram. A kilogram of resin will develop 9400 heat units, or about twice the average for wood. As a consequence, resinous woods have a greater heat value per pound than non-resinous woods, and this increased value varies, of course, with the resin content.

The available heat value of a cord of wood depends on many different factors. It has a relation not only to the amount of resin it contains but to the amount of moisture present. Furthermore, cords vary as to the amount of solid wood they contain, even when they are of the standard dimension and occupy 128 cubic feet of space. A certain proportion of this space is made up of air spaces between the sticks, and this air space may be considerable in a cord made of twisted, crooked, and knotty sticks. Out of the 128 cubic feet, a fair average of solid wood is about 80 cubic feet.

It is pointed out, however, that heat value is not the only test of usefulness in fuel wood and since 95 per cent of all wood used for fuel is consumed for domestic purposes, largely in farm houses, such factors as rapidity of burning and ease of lighting are important. Each section of the country has its favored woods and these are said to be, in general, the right ones to use. Hickory, of the non-resinous woods, has the highest fuel value per unit volume of wood, and has other advantages. It burns evenly, and, as housewives say, holds the heat. The oaks come next, followed by beech, birch, and maple. Pine has a relatively low heat value per unit volume, but has other advantages. It ignites readily and gives out a quick, hot flame, but one that soon dies down. This makes it a favorite with rural housekeepers as a summer wood, because it is particularly adapted for hot days in the kitchen.

The fuel qualities of chestnut adapt it particularly to work in brass foundries, where it gives just the required amount of heat and it is therefore in favor. Coastwise vessels in Florida pay twice as much for Florida buttonwood as for any other, because it burns with an even heat and with a minimum amount of smoke and ash.

The principal disadvantage of the resinous pines is their oily black smoke.

Editorial

THE TOWN FOREST

TEN years ago the idea of municipalities acquiring and managing forest land would have been greeted with derision or rejected as unpractical. To-day the policy is widely recognized, and, in at least one state, Massachusetts, an active campaign is being waged to secure the establishment of a town forest by every city, town and village.

The most fundamental use to which a town forest can be put is that of recreation. The ideas of our city and town dwellers are outgrowing the narrow and artificial confines of highly developed city parks, with their well-kept lawns, flower beds and shrubbery. These will continue to be the lungs of the city, for those who can spare a few moments for rest, and as a demonstration of man's improvements on nature.

But the spirit of our pioneer ancestry is strong within us. We long for a tramp in the wild woods, a view of nature in the rough. The great majority of us are without the leisure or the means of gratifying this instinct by extensive trips. A Saturday half-holiday, or part of a Sunday, for a trolley ride to some nearby point is the best we can do. What do we find? A dusty road, fringed with "No Trespass" signs, reinforced by belligerent property owners or hired watchers with dogs.

More and more it is becoming a vital necessity for communities to take into their own hands the responsibility for providing forest land free to the public. The essentials of a town forest, as distinguished from a city park, are larger areas, somewhat remote, though easy of access, on which improvements are confined to the construction of trails or roads, with a few essential structures to increase the comfort of the visitor. No attempt should be made to artificialize or "beautify" the forest, but the tract should be under a forester's care. The dead and dying trees should be marked, thus providing employment especially

during periods of labor surplus. The young crowded stands should be thinned and made vigorous. Waste areas—and of these there is only too great an abundance—should be planted. It may be possible to use dependent, pauper or convict labor on this great work for the public good. The more beautiful and accessible groves of mature trees—where a town is fortunate enough to secure such groves—should be preserved with care. The enjoyment derived by the public is worth far more than the commercial value of the timber. Much judicious cutting can be done, however, on portions of the area, for the purpose of renewing and building up the forest.

It has been argued that our municipalities are so corruptly governed that they are unfit for such responsibilities. Has this argument ever prevented the public from taking steps to secure the vitally essential city parks? And have not these parks been placed for the most part in the hands of boards composed of the best and most disinterested citizens? Have we any reason to suppose that the same keen and universal interest which has driven corruption and party politics out of our city park administration will not be equally effective in protecting the town forests?

Furthermore, the means is at hand and the procedure clearly shown by which this result can be secured. The employment of a trained forester who has also mastered the technic of landscape architecture, and the placing of this work under a board similar to the park boards, or even under the park boards themselves, will guarantee the success of the work.

It is time that every American municipality, large or small, should bestir itself in this matter. In no other way can equal benefit of so permanent a character be secured. Town forests must come, and come to stay.

THE PROTECTION OF BIG GAME

THE pioneer period in this country's development, when the good of all was best furthered by the unrestrained initiative of the individual, is passing and we are witnessing the dawn of a new era of intelligent commercial supervision and adjustment. This is nowhere shown so strikingly as in the handling of the problems of protection for big game animals. The frontier heroes—Boone, Crockett, Bowie and their associates—were primarily hunters. The squirrel rifle, with which feats of astonishing skill were performed, was the most useful implement of husbandry. The settler, clearing a home in the trackless forest, would many times have been forced to give up the desperate struggle for a living had

it not been for the abundance of wild game and fish, both large and small, with which he eked out his living and supported his family. The tradition that game is legitimate meat for the pioneer is still strong in newly settled regions, despite laws seeking to limit the killing and preserve the remnants of our wild life.

But with the demarcation of agricultural areas and the permanent segregation of true forest soils unfit for farming, came a change in the underlying economic situation. The increasing interest in big game hunting as a sport and the growing desire of the entire nation for the preservation and increase of these species of animals, the possibility of whose complete extinction has been so

thoroughly demonstrated in the case of the buffalo, have led to the widespread consideration of practical measures for protection.

This first took the form of game laws limiting the hunting seasons, restricting the size of the bag, and forbidding commercial trafficking in game animals and birds. But with the growing army of hunters, the restriction of the native ranges, and the continued inefficacy of administration, animal and bird life continued to shrink at an appalling rate. Lately a new and more promising line of effort has been inaugurated, in the form of refuges or sanctuaries, where the harried remnant of our wild creatures may grow and multiply, secure in the protection of their overlords, who hold for them the power of life or death.

The greatest of these refuges is that established in and surrounding the Yellowstone National Park, where the American elk, largest of our deer species, may be seen in herds numbering thousands.

One of the most remarkable phenomena of these refuges is the swift adaptation shown by the wild creatures, and the almost complete disappearance of that timidity upon which they formerly depended for their very existence. Even the wild fowl, mallards and geese, retaining their wariness during migration, learn that they are safe in certain places and permit the approach of their human enemies on protected lakes.

The administration of these refuges for big grazing animals like the elk demands constant and intelligent

supervision. With the destruction of predatory carnivorous animals, the elk soon increase, even to the point where there is insufficient forage and starvation thins the herds. Winter grazing is impossible on high slopes, and the carrying capacity is limited to the number which can survive the winter on such low lands or valleys as are still open to them. Here they conflict with the encroaching settlers on agricultural lands, and it is now necessary for the Government to purchase hay to preserve some herds from extermination during this period. The elk, of course, consume forage that would otherwise be available for sheep and cattle.

Elk grazing, then, becomes as much of a science as the raising of sheep, and any attempt to overlook this fact will result in repeated tragedies. The overlords must care for their subjects, who can shift for themselves only within the inexorable laws of food supply imposed by natural conditions.

There is but one efficient method of administering so vital and complex a problem. The National Government, upon whose lands, park and forest these game refuges for elk have been established, should have complete control of the herds, determine their grazing limits, the number which may annually be killed from the natural increase, and supervise the activities of hunters. *The illegal activities of tusk hunters must cease.* The states must unite, for the common good, in permitting the nation to exercise unrestricted control over national game refuges.

INDIANA'S NEED—A TRAINED STATE FORESTER

THE time has gone by in this country when state forestry work requiring trained supervision can be successfully directed by persons appointed for political reasons and lacking the training requisite to fitness for the office. Indiana alone of all the Eastern States still adheres to this plan. The present state forester had no education in his subject at a professional forest school, and his acquaintance with his duties is such as he has been able to absorb after his appointment. This means education at the expense of the state. Even with the best intentions on the part of the forester, such a system cannot recommend itself to the taxpayers of Indiana, and should the incumbent prove indifferent to his responsibilities and regard his salary as a reward for political services previously given, rather than payment for duty to be performed, the system breaks down completely.

Minnesota, which permits the State Forestry Board to appoint its own executive forester, secured a graduate of the State Forestry College and has retained him ever since 1911. Wisconsin has had a trained forester since 1904. Michigan state forestry work has been in the hands of a trained man since 1899, the present state forester being a graduate of a forest school.

Kentucky in establishing its State Forestry Department in 1912 prescribed in the law that the forester must

be a technically trained man. A graduate of a forest school was appointed and has been recently reappointed for four years.

Six Southern States have established forestry departments and in every instance have insisted upon the appointment of trained men as state foresters. Forest school graduates are in charge of the State work in Vermont, New Hampshire, Connecticut, New York, New Jersey, and Pennsylvania. Practically all states which have forestry departments at all have insisted that foresters shall be employed by the state instead of politicians to run the department.

The State Forestry Board of Indiana was created in 1903, but the law which established the Board made it impossible for the Board ever to do effective work by depriving it of the power to appoint its secretary or state forester.

As a result not a single appointee to this office in the last fourteen years has had any technical equipment for his work, and the system is a failure. Indiana must change her forestry law and give to the State Forestry Board the power to appoint a technically trained and scientifically equipped state forester. A continuance of the present policy means lack of progress in forestry in the State.

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Mr. Beede Made Secretary

Mr. Victor A. Beede, Assistant State Forester of New Hampshire, has been elected Executive Secretary of the New York State Forestry Association, with headquarters at the Chamber of Commerce Building, Syracuse, New York. Mr. Beede is a graduate of Yale University, the Yale Forest School, and has had considerable experience along forestry lines. Following his graduation he visited France, Germany and Switzerland, and observed his forest practice in those countries. He has served as Forester and Assistant Secretary of the Massachusetts Forestry Association and as Forest Assistant on the Pike National Forest in Colorado. Mr. Beede will take up his new position on November 1st.

Book News

Seeding and Planting in the Practice of Forestry, by James W. Toumey, M.D., M.A., 454 pages, cloth \$3.50. John Wiley & Sons, Inc., New York City. Prof. Toumey is director of the Forest School and Professor of Silviculture at Yale University.

This book presents both the details of practice and the fundamental principles that control success and failure in the economic production of nursery stock and the artificial regeneration of forests. It explains the *why* as well as the *how*. The author states in his preface: "The practitioner must have a clear appreciation of underlying principles or he cannot be safely trusted to direct the details of nursery practice, seeding and planting. He must have a broad knowledge of methods and tools in order that he may attain successful regeneration at the least cost." Almost without exception, the cultural methods described and the tools and machines figured have been used by the author, or the results of the work observed by him in this country or abroad. Part I of the book deals with the silvical basis for seeding and planting, more particularly the principles which underlie the choice of species, the closeness of spacing and the composition of the stand. Part II is descriptive of the various operations in artificial regeneration and the results that may be expected from the best practice.

A Correction

On page 420 of the July number of AMERICAN FORESTRY there appears a series of questions under the title of "Advice for Many Here." J. S. Illick, acting director of the State Forest Academy at Mont Alto, Pennsylvania, takes exception to the following from the answer to question 3: "The Balsam Fir is native to the Adirondack Mountain section, but not in Pennsylvania." Mr. Illick says: "The latter part of this statement is not correct. The Balsam Fir (*Abies balsamea*) is native to the counties of Pike, Monroe, Sullivan, Lycoming, Clinton, Tioga, McKean, and Center, in the State of Pennsylvania. Its distribution is local, but in the well watered portions, especially swamps, of the above-named counties the tree is quite common. In the Bear Meadow region of Center County it covers a considerable area, and about the many lakes in Pike and Monroe Counties it is found rather abundant. Furthermore, it even extends along the Allegheny Mountains to Virginia."

Pine for Kraft Paper

Experiments with jack pine have shown that it is well suited for making kraft paper. On some of the National Forests this tree is used to plant land which is too poor to grow other timber.

Canadian Department

BY ELLWOOD WILSON

Secretary, Canadian Society of Forest Engineers

On the eighteenth of September Mr. Clyde Leavitt, Forester to the Dominion Railway Commission, and Mr. Robson Black, Secretary of the Canadian Forestry Association, and the writer made an inspection trip along the line of the National Transcontinental Railway, operated by the Quebec Government, from La Tuque, which is about 200 miles northwest of Quebec, to Amos, a newly settled town not far from the Ontario line, the whole distance covered being about 300 miles. The trip was made on a motor speeder and was under the guidance of Mr. Henry Sorgius, Manager of the St. Maurice Forest Protective Association.

From La Tuque to Parent the country is mostly of the hardwood spruce, balsam type, and has been pretty well lumbered, and was largely burned when construction commenced, until a co-operative association was formed to protect the limits along the right-of-way. From Parent west to Nottaway is almost all of the jack pine-white birch type and from Nottaway west to the Ontario boundary the soil is clayey and covered with dense stands of small black spruce, which rarely attains a greater diameter than eight inches at breast height.

From La Tuque to Nottaway the country is rocky and sandy and unfitted for anything but forest growth. From Nottaway west one is in the so-called clay belt, where the soil is good, the climate no more rigorous than in the district around Quebec City, and in which in time a prosperous farming community should spring up, provided proper fire protection is furnished.

At Amos, a new town of about 300 people, boasting a church, several saw-mills, some stores and a hotel, and the residence of the local agent of the Department of Crown Lands, we met the Deputy Minister of Lands and Forests, Dr. Dechene, who was making an inspection trip through the district. Just beyond Amos is the internment camp of Austrians and Germans at Spirit Lake, where the interned aliens are engaged in clearing off the forests and making farms for settlers. The disastrous Ontario fire of last season swept almost over to this point, and in several of the Quebec villages houses and saw-mills were burned.

The trip showed us the absolute need of patrol on the line of the railroad beyond the territory patrolled by the St. Maurice

Forest Protective Association. In its territory there have been no large fires for four years and the result is very marked. The country is green and the young growth is doing well. The section from La Tuque to Nottaway, about two hundred and fifty miles, should on no account be settled, for there is practically no agricultural soil, but should be set aside as a forest reserve.

Mr. Roy Campbell has lately returned from Europe, where he went with a government commission to inspect conditions in that unhappy country. He said the point which interested him most was the evidence of forest management in the mountainous region inland from Bordeaux and Limoges, a high plateau of sandy country, with patches of managed forests of from a hundred to a couple of thousand acres, and showing us the way in which things should be handled in this country. Throughout this region cutting had quite evidently been accelerated on account of the demand for posts for use in the trenches. Everything was cut from five inches upwards and the largest trees were ten inches on the stump. The litter was carefully cleared up and the small branches piled to be used for fuel. The durability of the oak floors in the old houses was also noted; some of these had been down for a couple of hundred years and still retained their beauty. In England the extensive use of creosoted wood was noted, and the railroad ties were larger and longer and seemed good for at least ten years' longer service than with us.

The forest survey of New Brunswick is under Mr. P. Z. Caverhill, progressing favorably, about 200,000 acres having been covered to date, and some of the maps are nearly completed. A couple of points have presented themselves which required immediate attention, such as the examination of licensed lands for the cutting of undersized trees for pulp, examination of areas for settlement purposes; in one case 4000 acres had to be examined. The result of this work was so satisfactory that the Premier has ordered a soil-type map to be made of the whole forest area, which will be invaluable in the opening of lands for settlement. The Premier has made an inspection trip of some of the work and has taken a great interest in it. The question of a better system of fire protection will come up soon and New Brunswick will soon have a record to be proud of.

Mr. B. K. Ayres, of the Canadian Society of Forest Engineers, is moving shortly from Ansonia, Connecticut, where he has been with the Ansonia Forest Products Company, to Concord, New Hampshire, where he will operate on his own timber lands.

Mr. H. G. Schanche who has been with the Laurentide Company, Limited, and is now finishing his forestry work at Pennsylvania State College, has been elected an Associate Member of the Canadian Society of Forest Engineers.

M. A. Grainger, Acting Chief Forester, who outlined briefly the scope of the British Columbia Forest Branch and its relation to the lumber industry, and H. R. MacMillan, who tendered evidence concerning the export position as affecting the British Columbia lumber industry, were among the witnesses examined by the Dominion Royal Commission during its sittings at Victoria, September 20-22.

Mr. H. R. MacMillan, who for the last year and a half has been engaged in a study of the lumber export markets of the world, for the Dominion Department of Trade and Commerce, has tendered his resignation as Chief Forester to the Hon. W. R. Ross, Minister of Lands, in order to accept a position with the Victoria Lumber and Manufacturing Company, of Chemainus, British Columbia. Mr. MacMillan was one of the first Canadians to take up forestry as a profession, and has been prominently identified with the forestry movement in Canada for almost ten years, first in the Dominion Forestry Branch, and, since 1912, with the British Columbia Forest Service. His former and present associates will keenly regret Mr. MacMillan's decision to sever his connection with the governmental forestry work, but wish him all success in his new position.

Dr. H. N. Whitford and Mr. Roland D. Craig, having completed their report to the Commission of Conservation concerning the area of merchantable timber in British Columbia, in which work they have had the co-operation of the Provincial Forest Service, have now left the province, the former to take up a position in the Forest School, Yale University, and the latter having gone to Ottawa.

Mr. Louis B. Beale, Lumber Commissioner for British Columbia, stationed at Toronto, has returned to Victoria for consultation with the Forest Branch, and the lumber manufacturers, concerning the future development of that important work. The British Columbia Lumber Exhibit, under Mr. Beale's management at the recent Canadian National Exhibition, attracted notable attention, and as evidence of the growing interest in the Eastern market for British Columbia woods, it may be mentioned that during the first two or three days over 3000 samples of wood were taken away by persons interested, and hundreds

entered their names to receive further information, etc.

The active service list of members of the British Columbia Forest Branch continues to grow, and to date 68 have enlisted, in addition to 47 forest guards. Messrs. Mitchell and Rees have won the Military Cross.

White pine blister rust has been reported around Montreal and Mr. G. C. Piché, Chief Forester of Quebec, is taking measures to ascertain the extent of the disease.

Hon. Jules Allard, Minister of Lands and Forests of Quebec, and Mr. G. C. Piché will pay a visit to the nurseries and plantations of the Laurentide Company, Limited. They will also inspect the power plants at Shawinigan Falls and the Quebec Government Nurseries at Berthierville.

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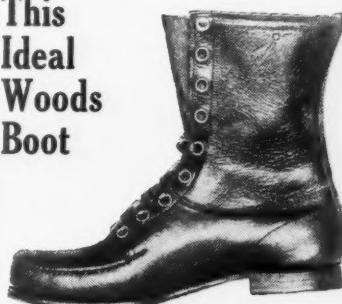
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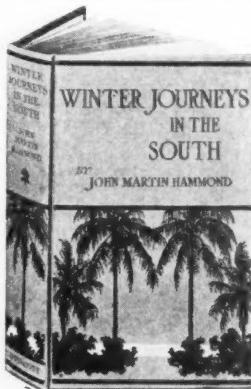
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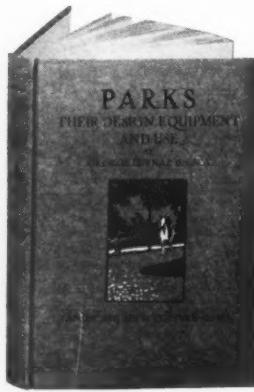
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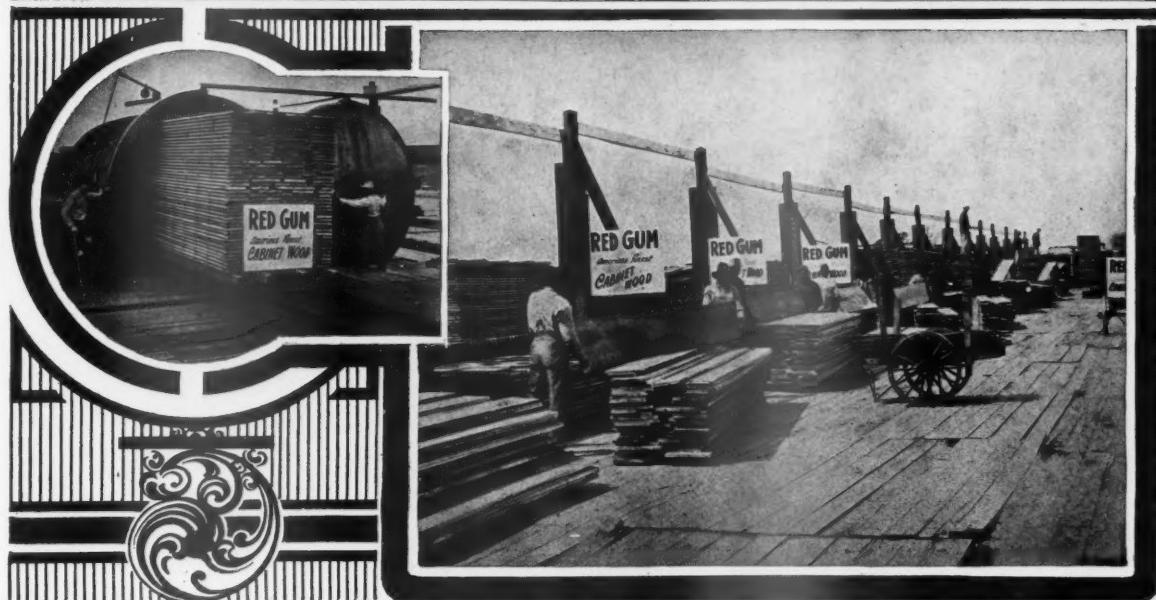
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Declaration of Principles and Policy of The American Forestry Association

IT IS A VOLUNTARY organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

IT IS INDEPENDENT, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

IT DECLARIES THAT FORESTRY is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay \$367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

IT RECOGNIZES THAT forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon national and State forest reserves for the benefit of the public.

IT WILL DEVOTE its influence and educational facilities to the development of public thought and knowledge along these practical lines.

It Will Support These Policies

National and State Forests under Federal and State Ownership, administration and management respectively; adequate appropriations for their care and management; Federal cooperation with the States, especially in forest fire protection.

State Activity by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners; non-political departments; independent forest organization with liberal appropriations for these purposes.

Forest Fire Protection by Federal, State and fire protective agencies, and its encouragement and extension, individually and by cooperation; without adequate fire protection all other measures for forest crop production will fail.

Forest Planting by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

Forest Taxation Reforms removing unjust burdens from owners of growing timber.

Closer Utilization in logging and manufacturing without loss to owners; aid the lumbermen in achieving this.

Cutting of Mature Timber where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

Equal Protection to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

Classification by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

